FIG. 158

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FIG. 159

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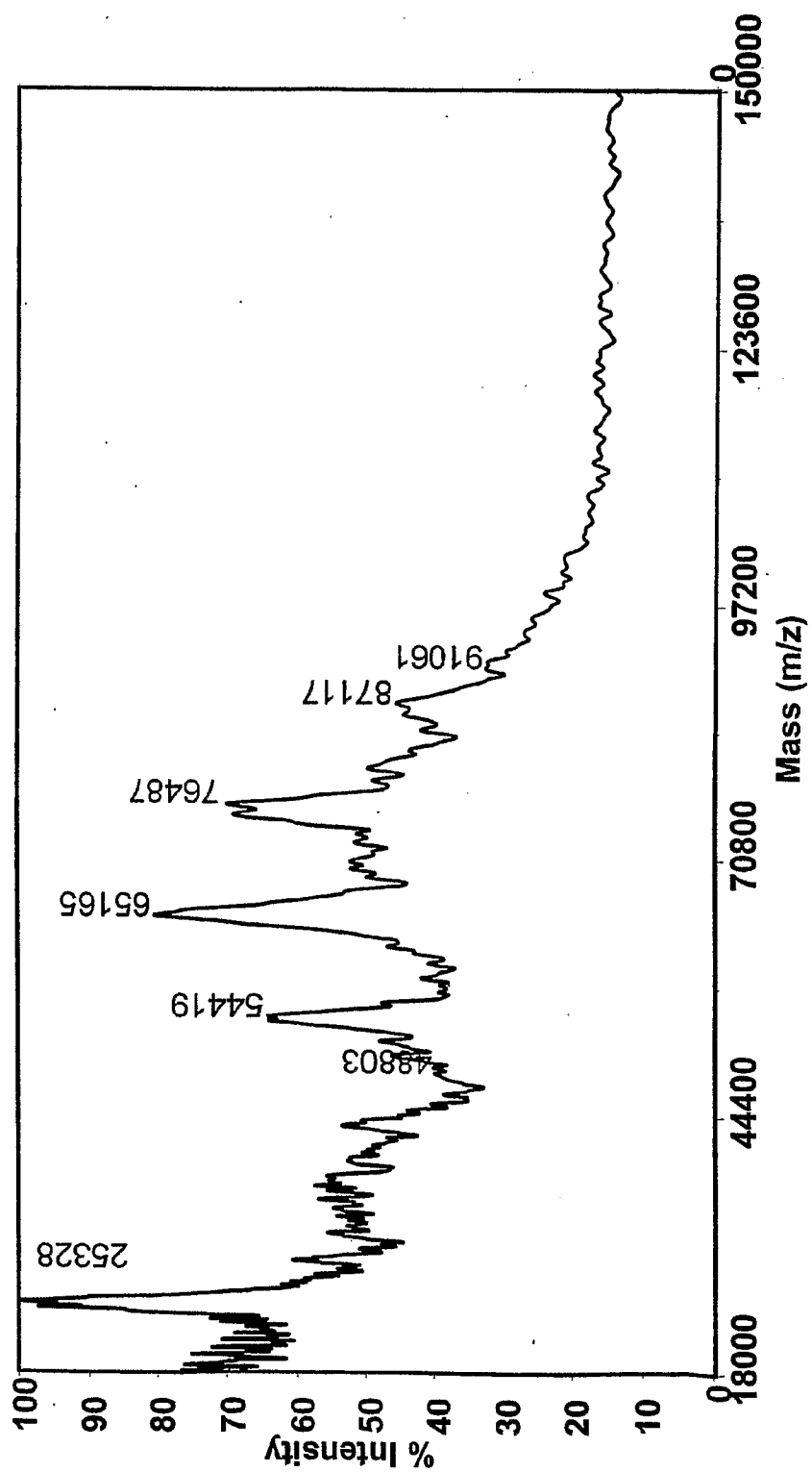


FIG. 160
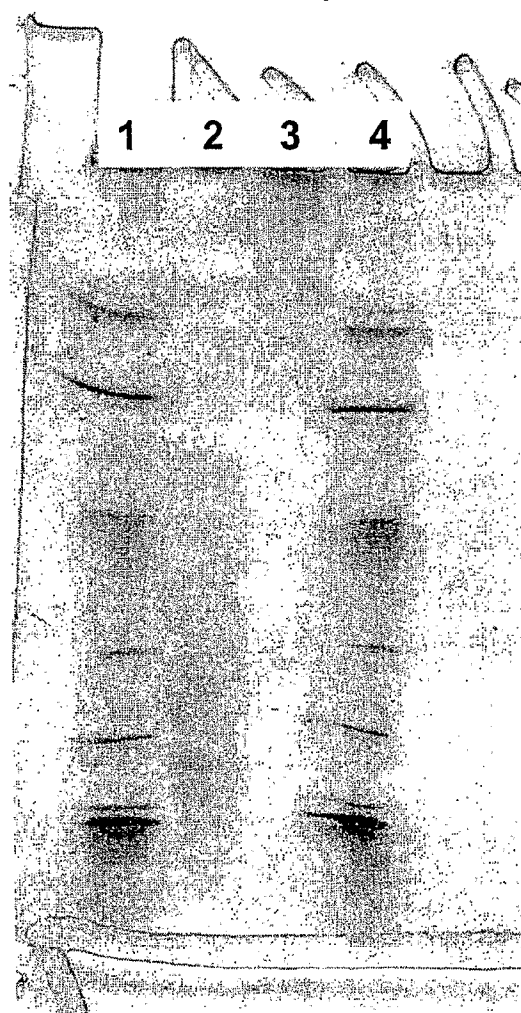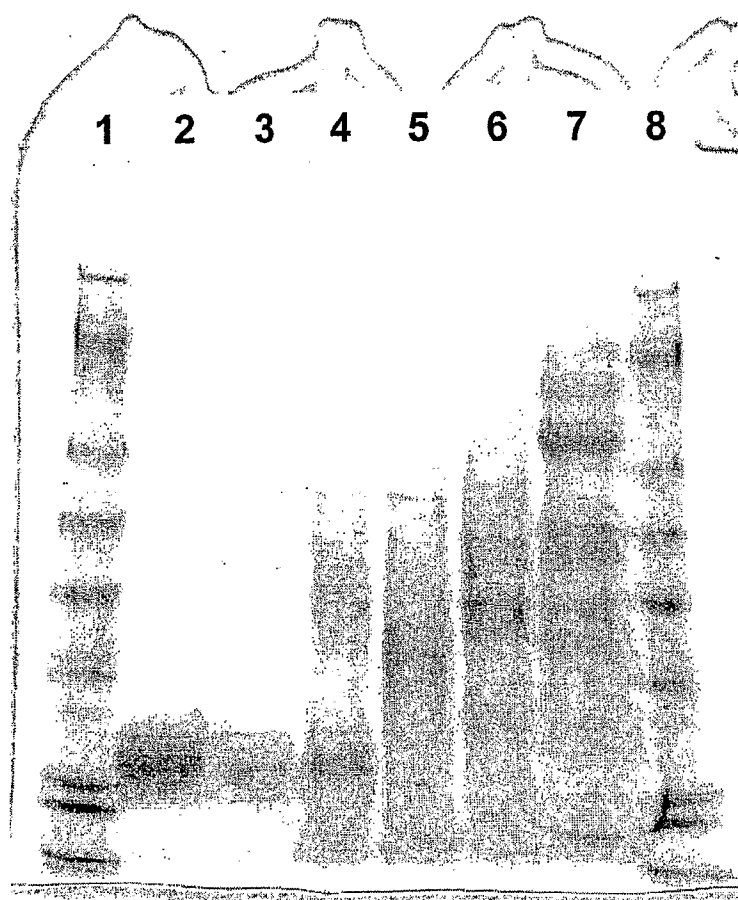
FIG. 161

FIG. 162

FIG. 163

FIG. 164

FIG. 165

FIG. 166

FIG. 167

FIG. 168

FIG. 169

rFSH-SA-PEG (10 KDa) —

rFSH-SA-PEG (1 KDa) —

rFSH —
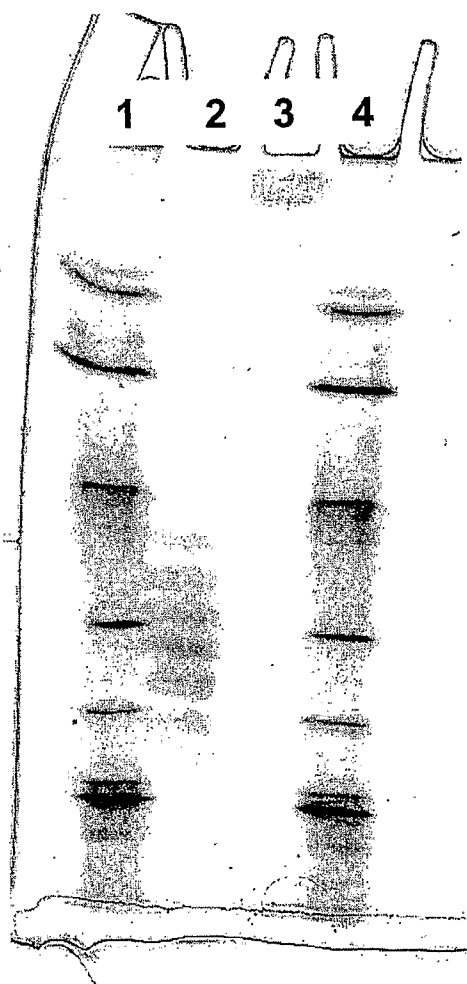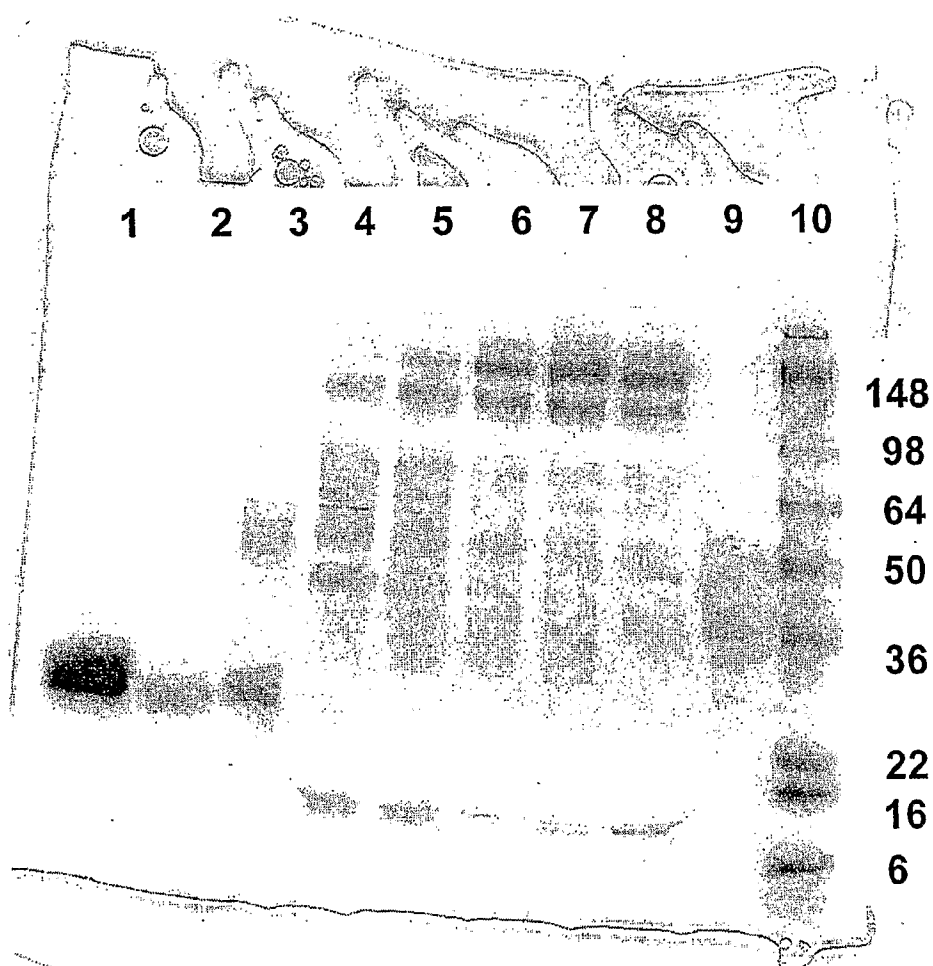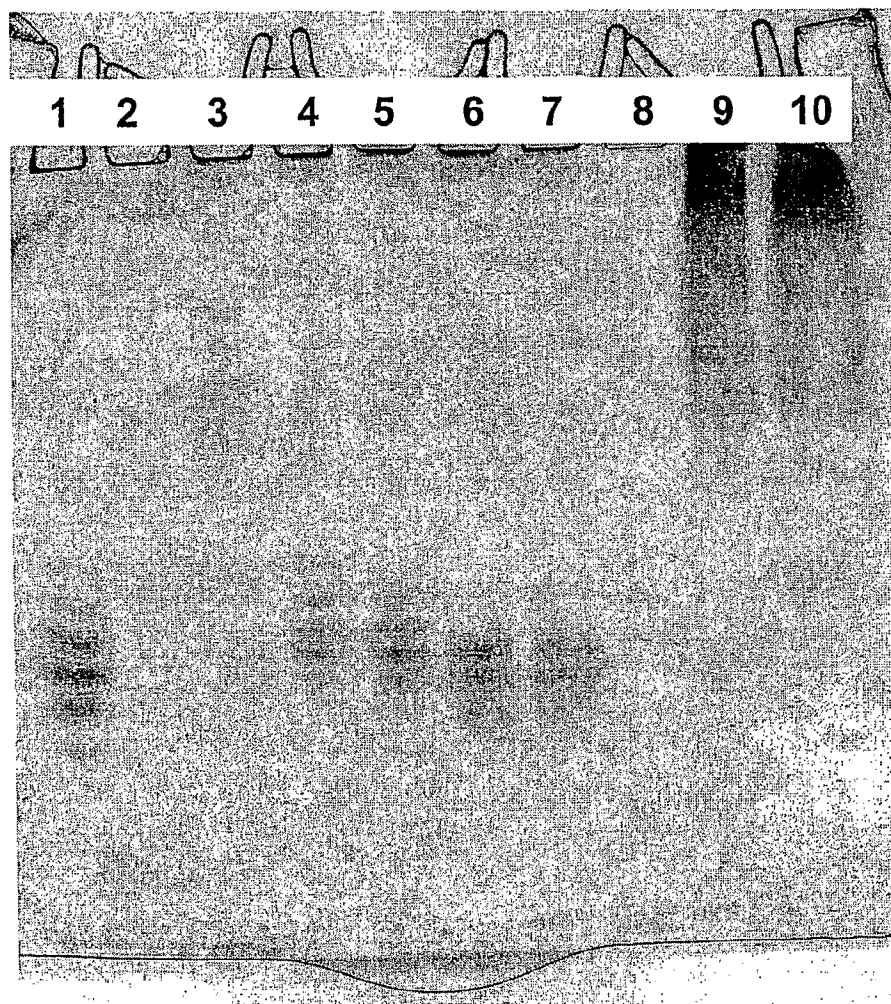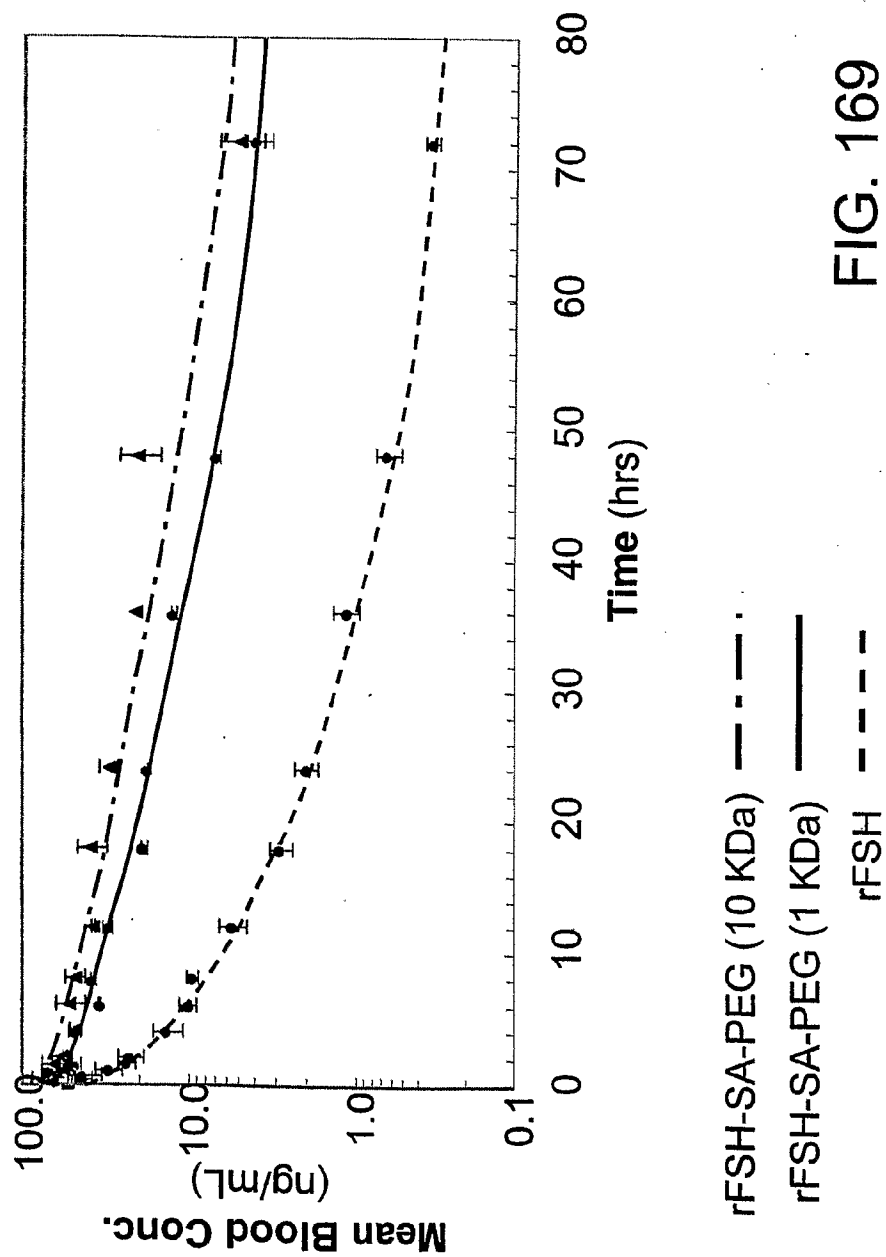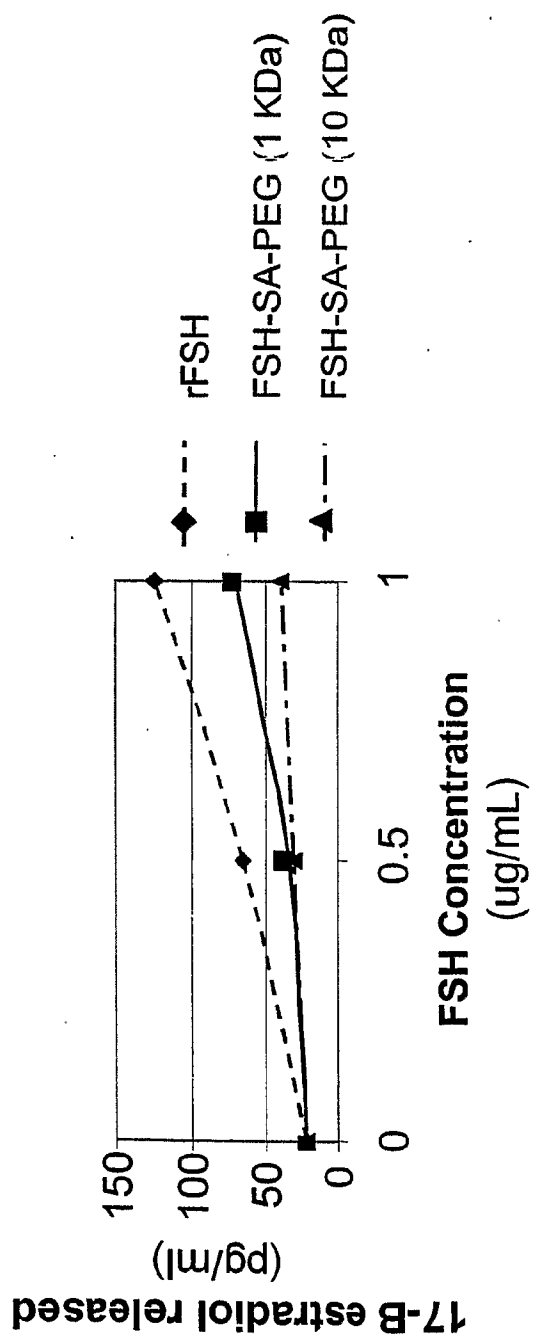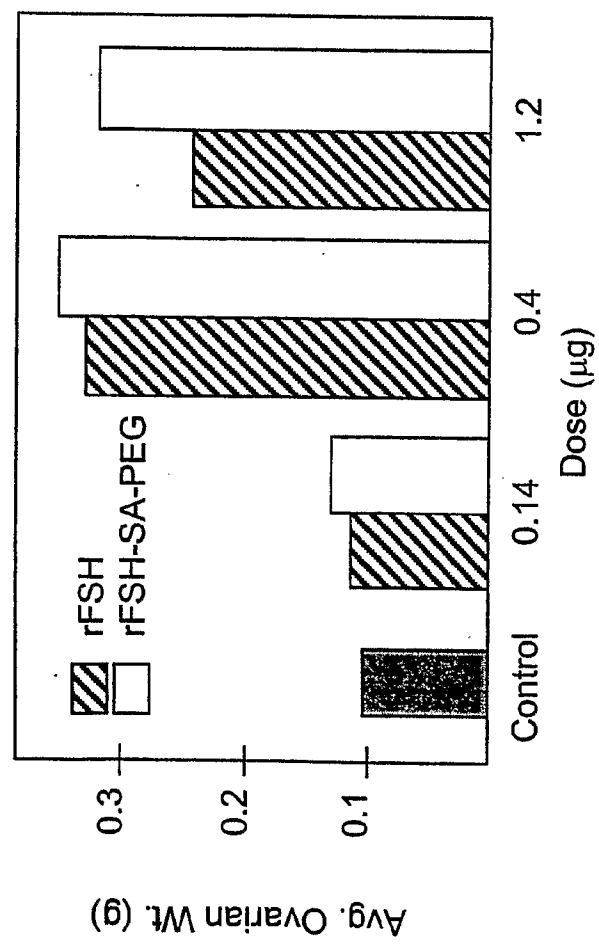
FIG. 170

FIG. 171

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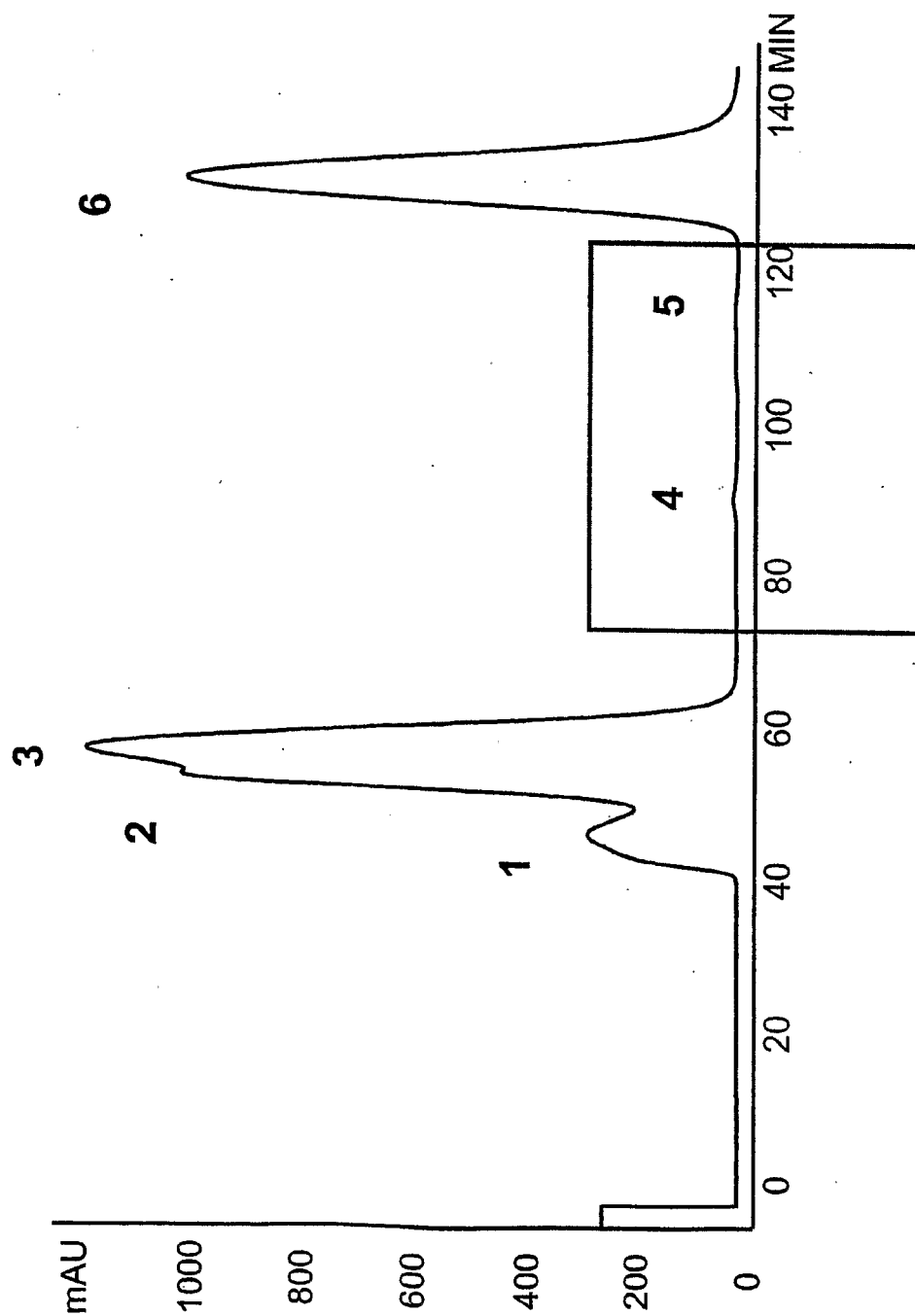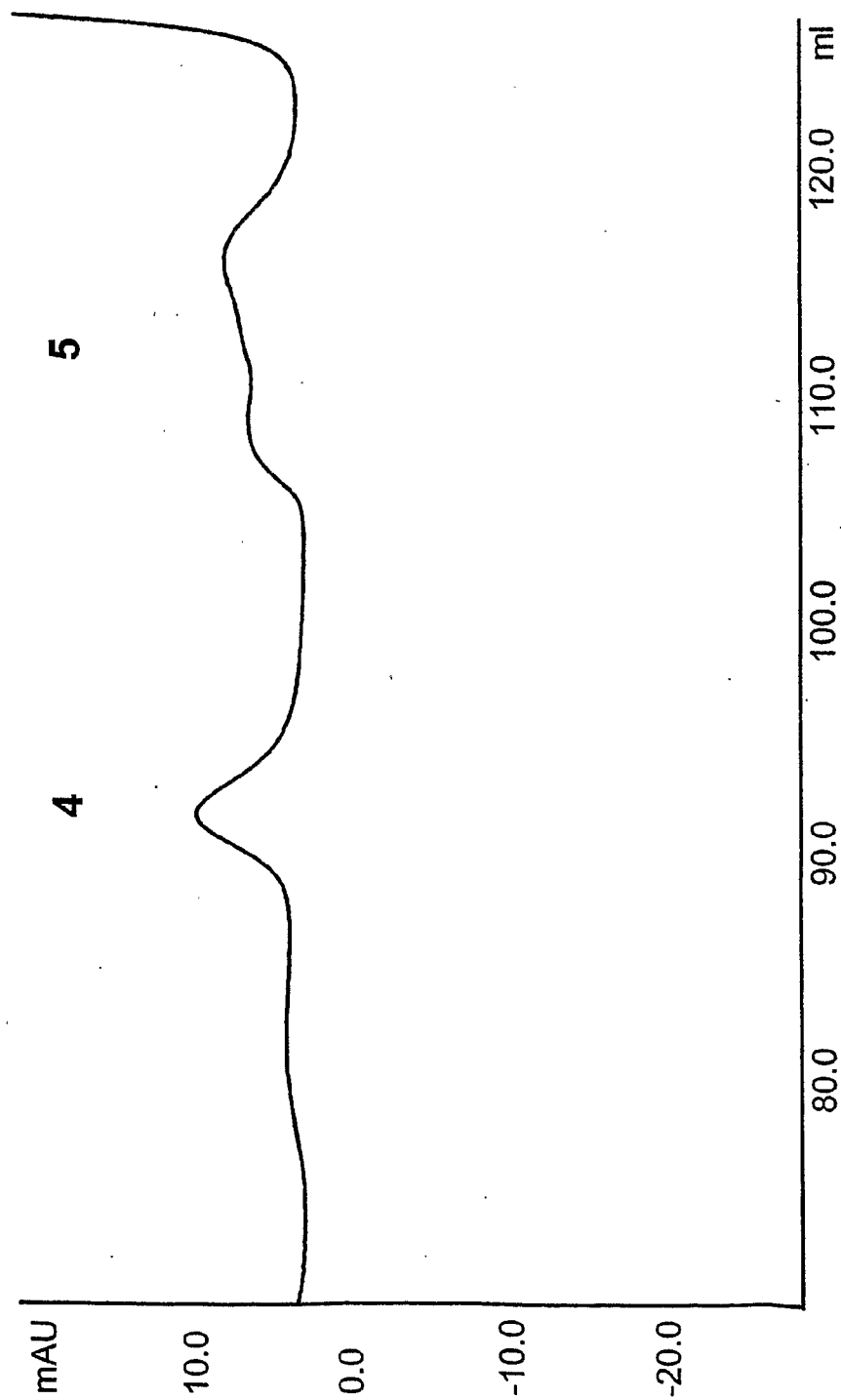


FIG. 172A

FIG. 172B
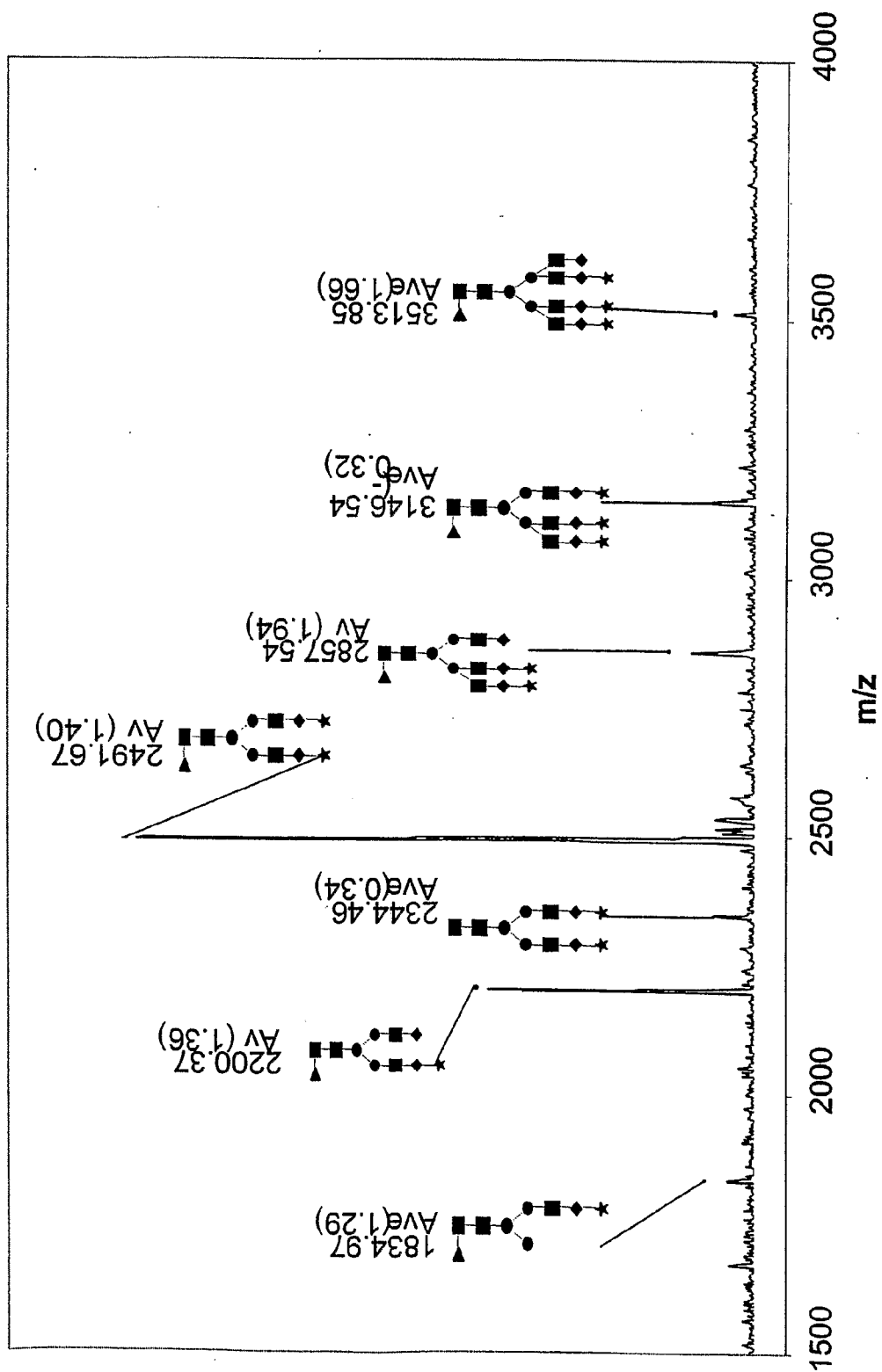
FIG. 173A

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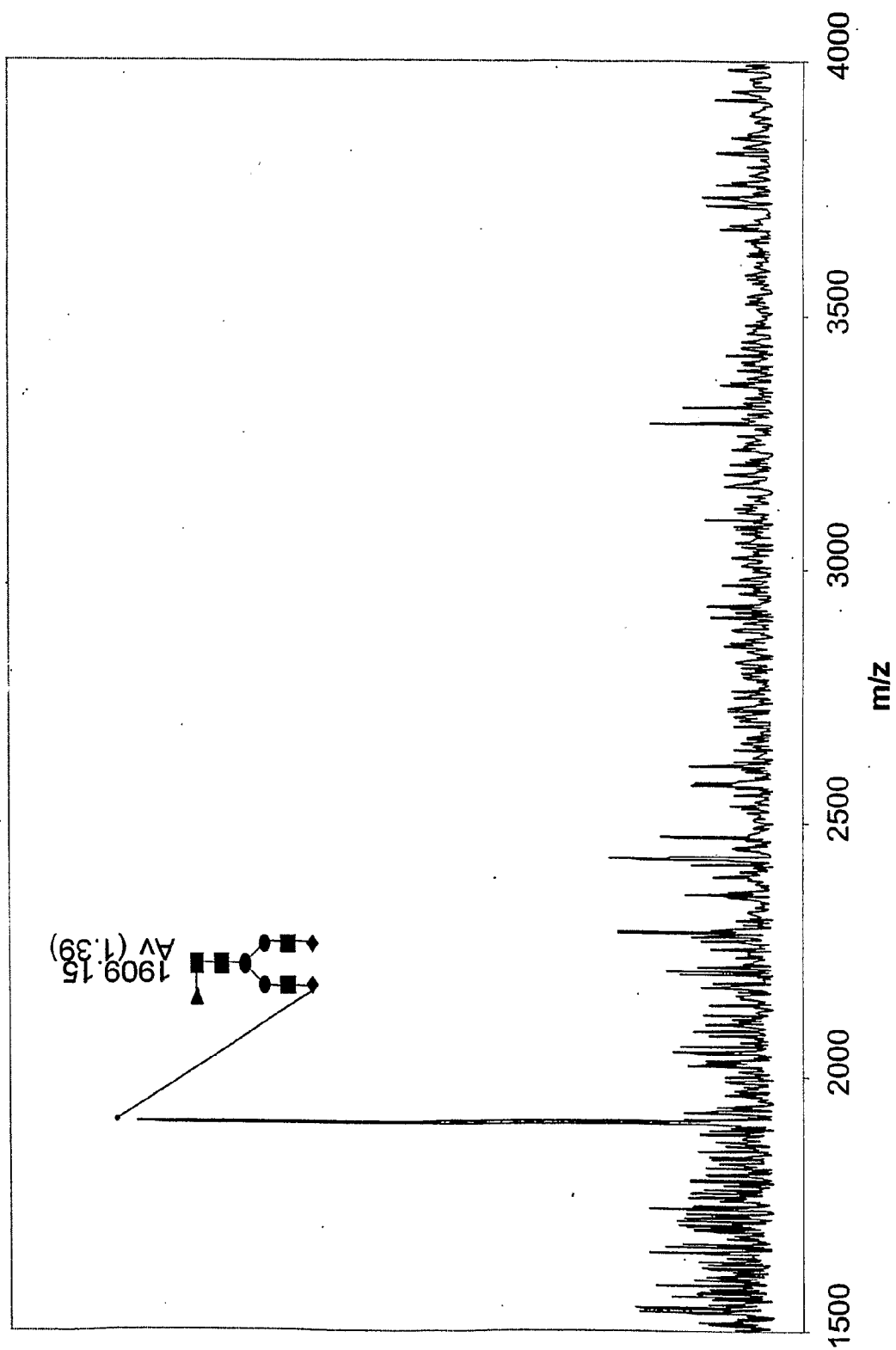


FIG. 173B
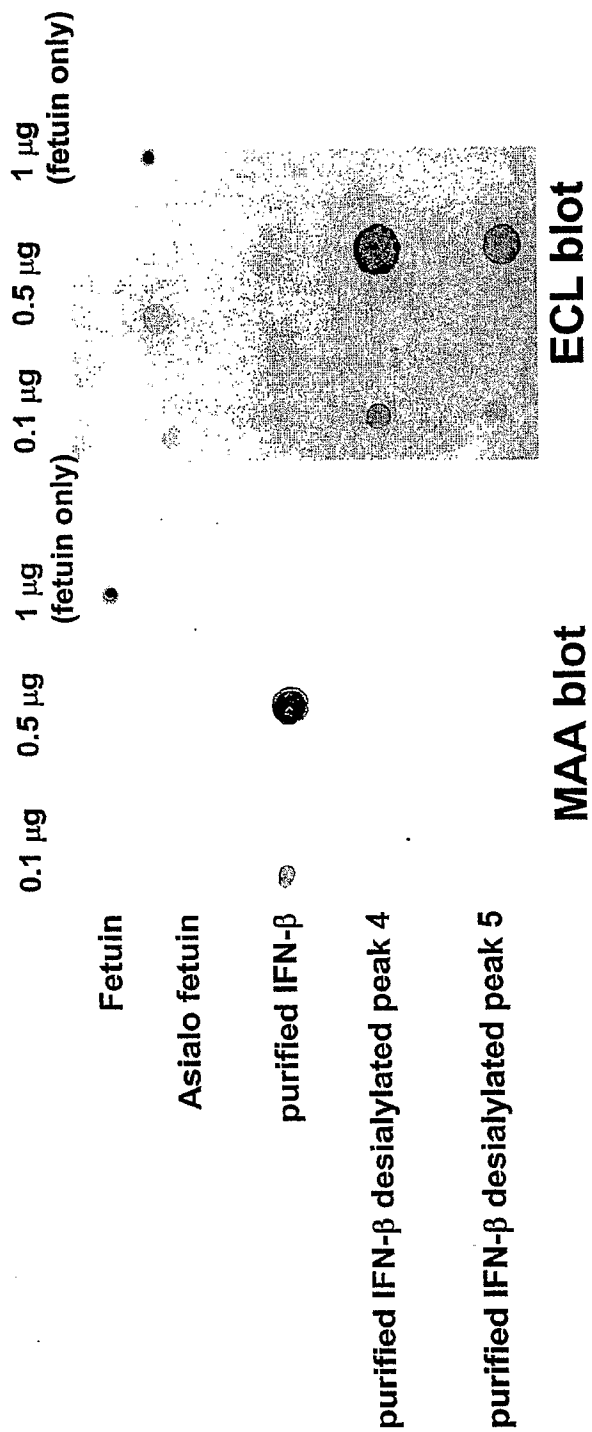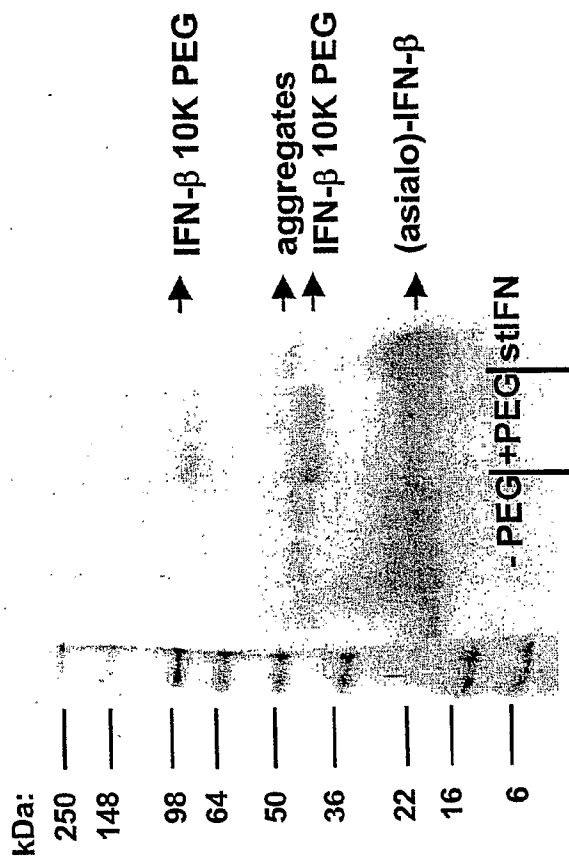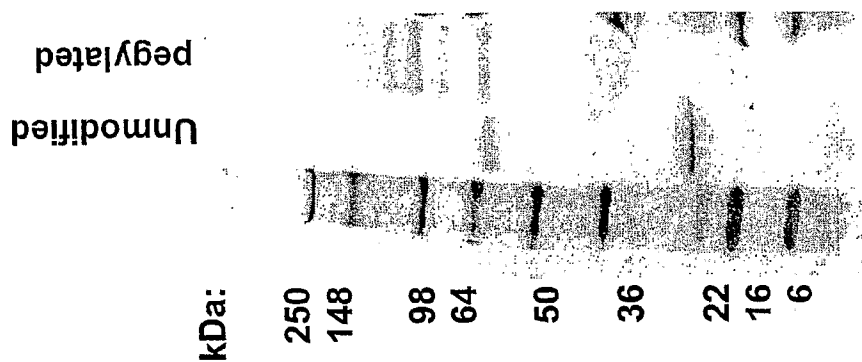
FIG. 174

FIG. 175

FIG. 176

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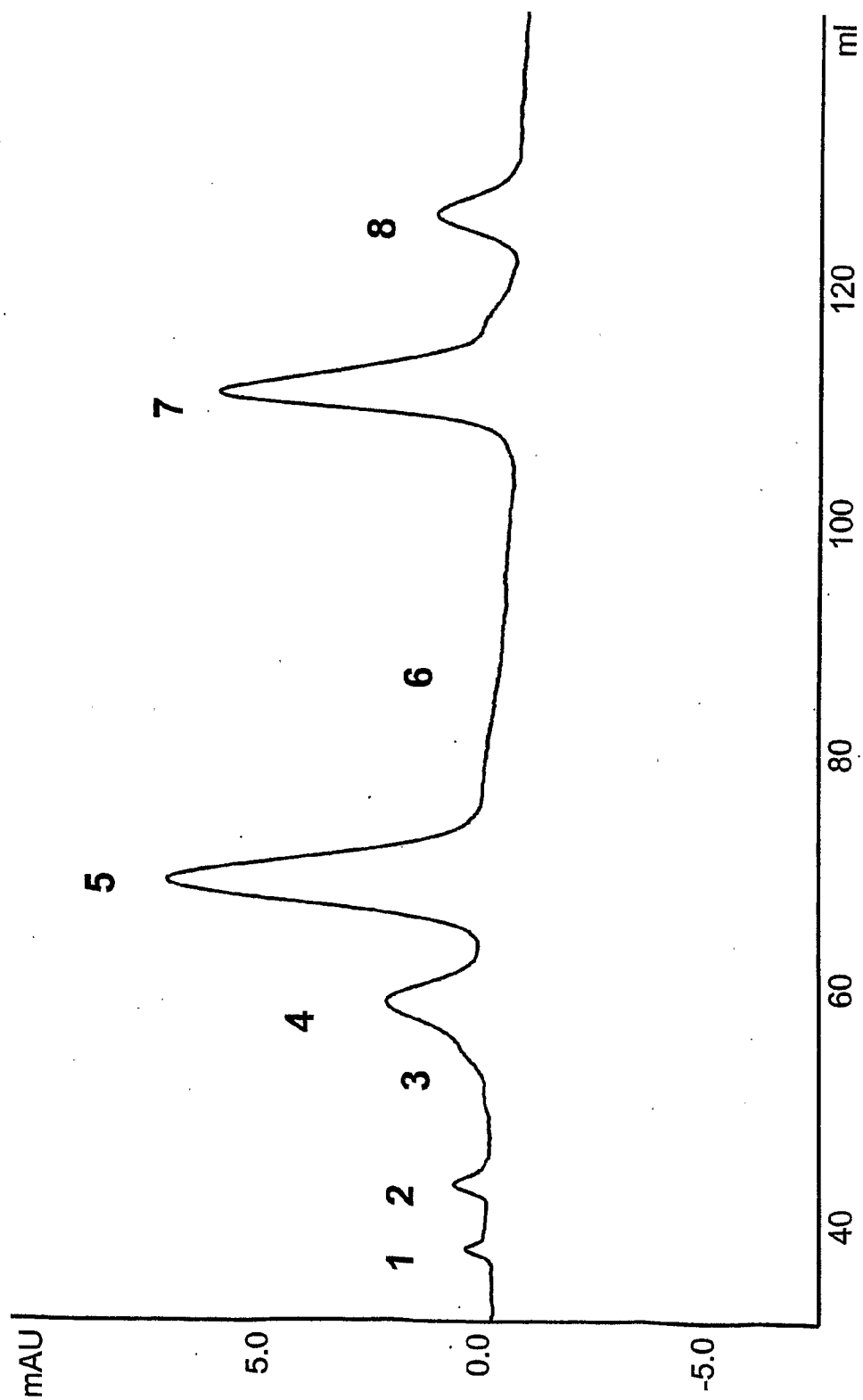


FIG. 177

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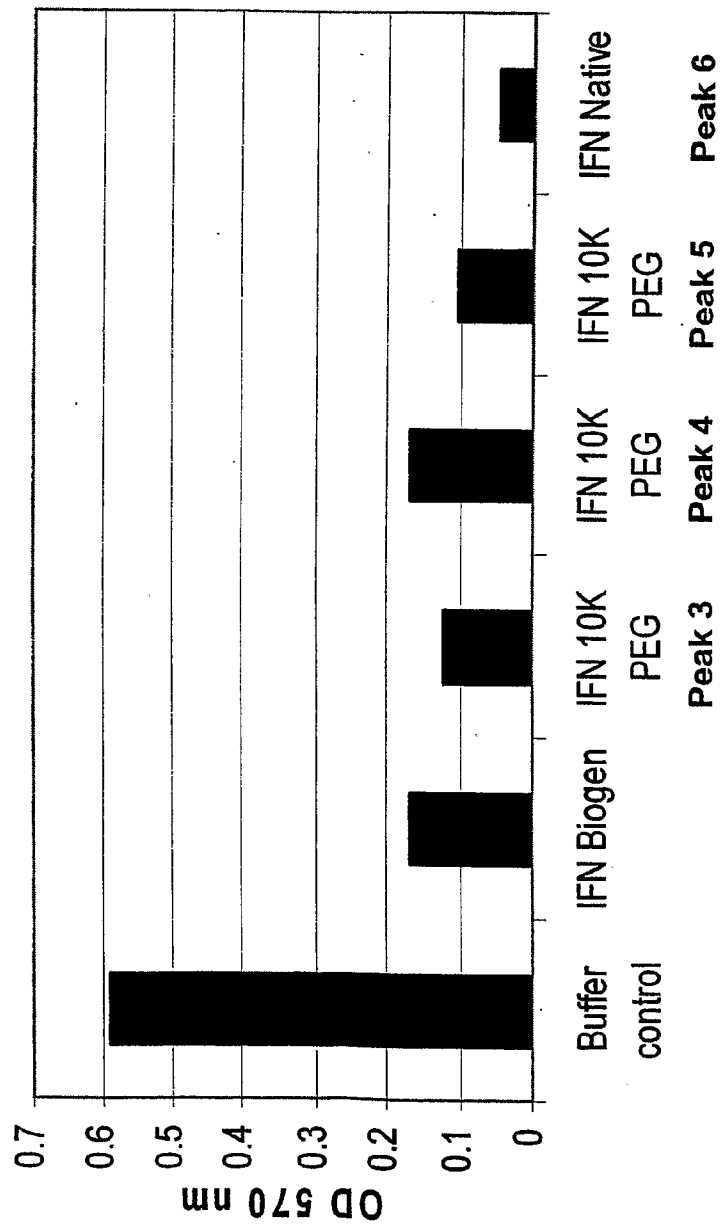


FIG. 178

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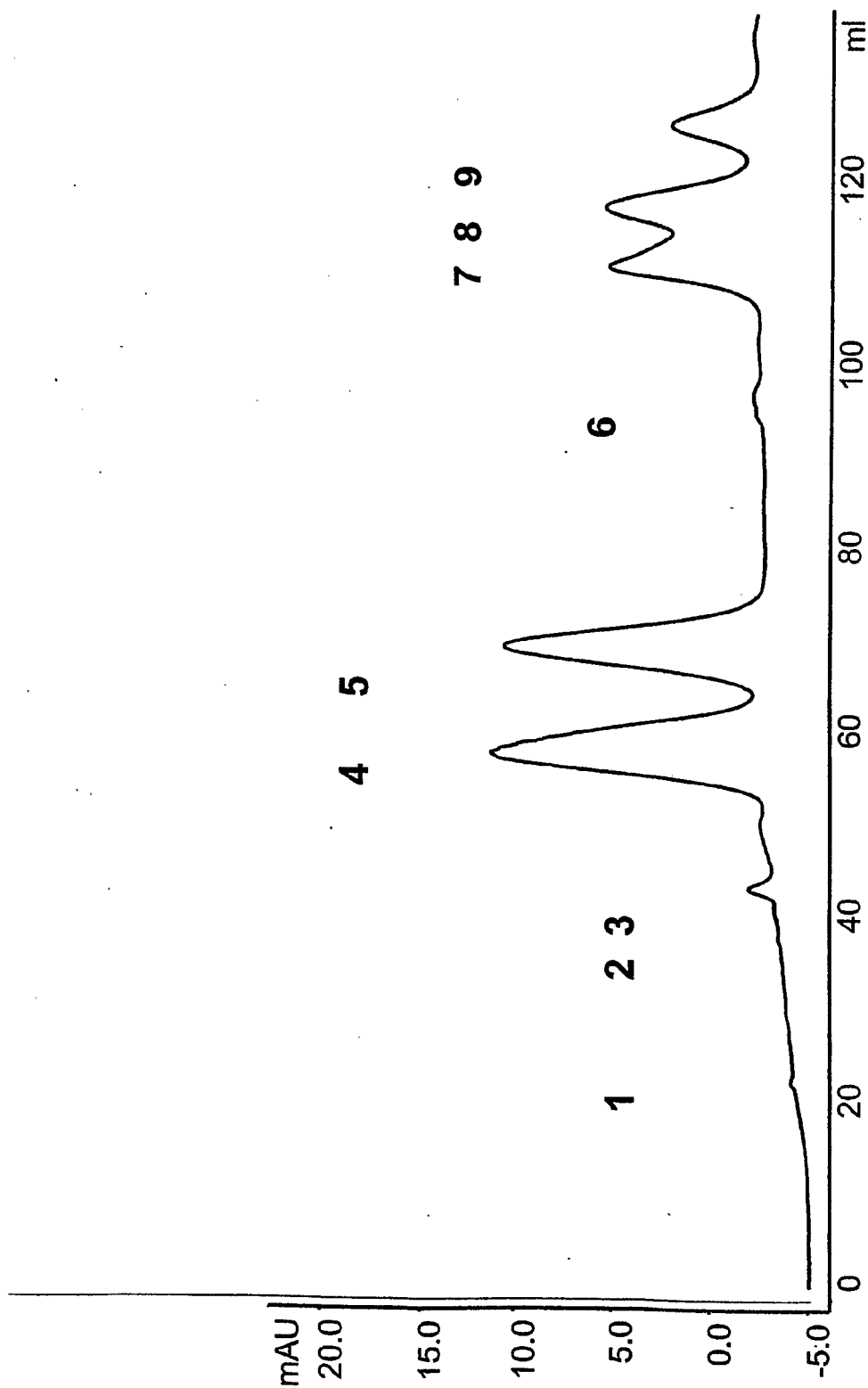


FIG. 179
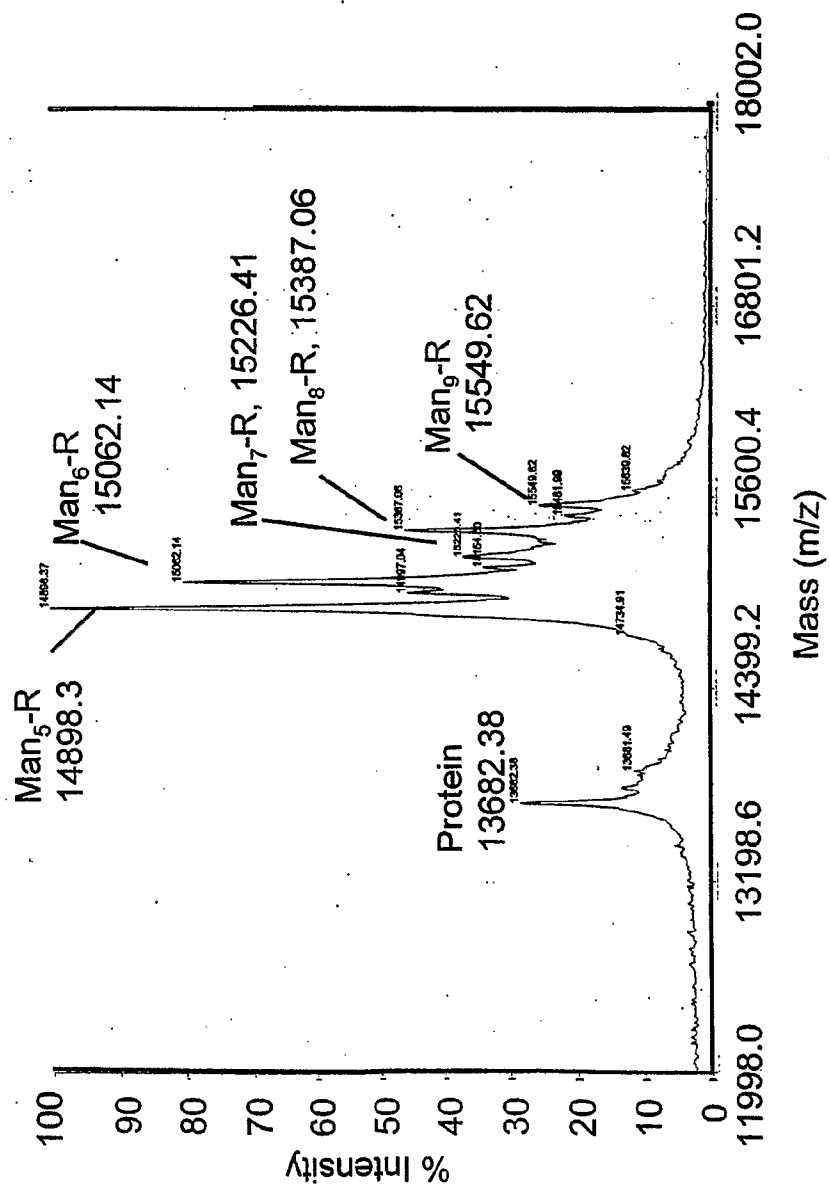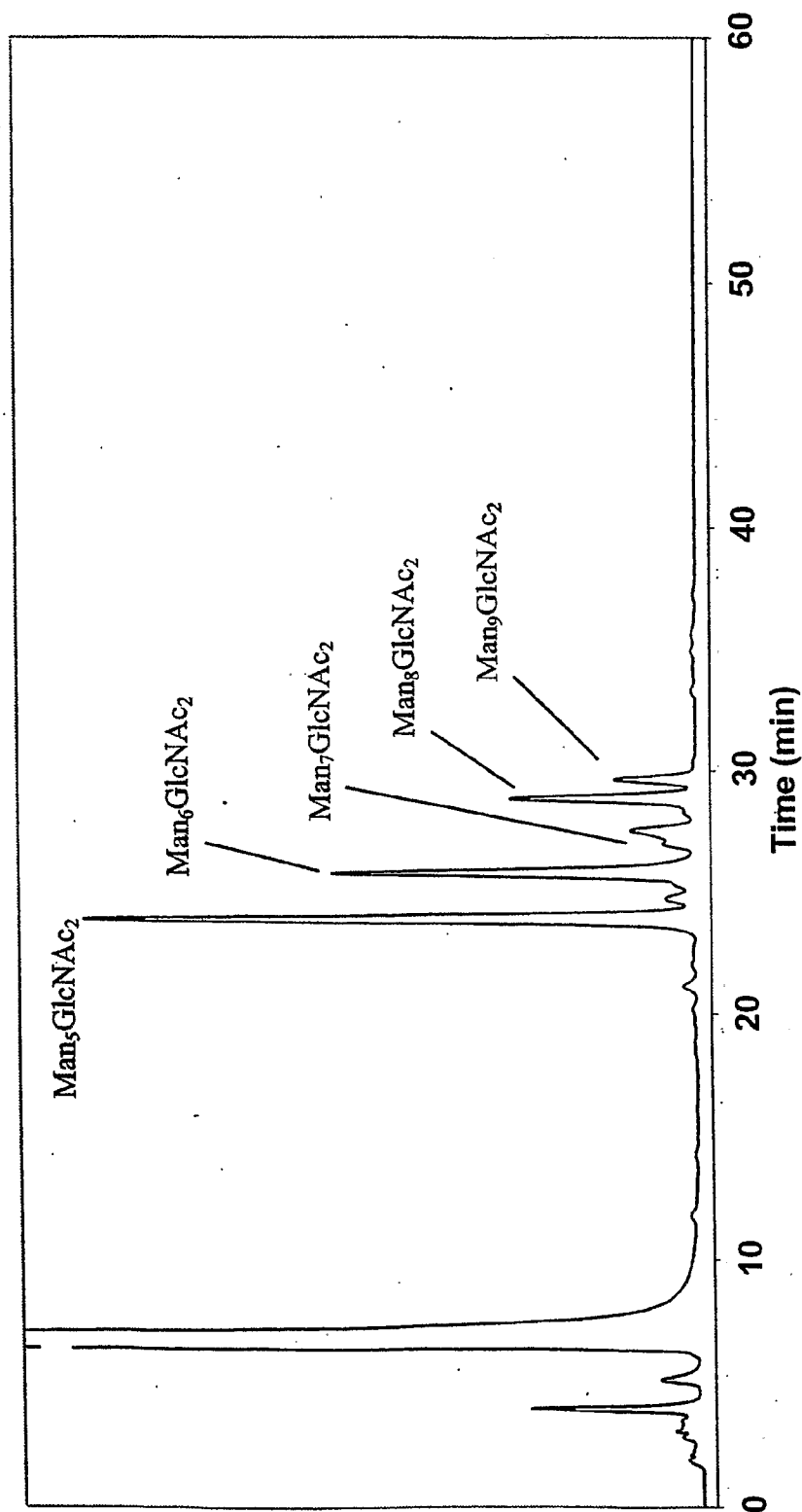
FIG. 180A

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FIG. 180B
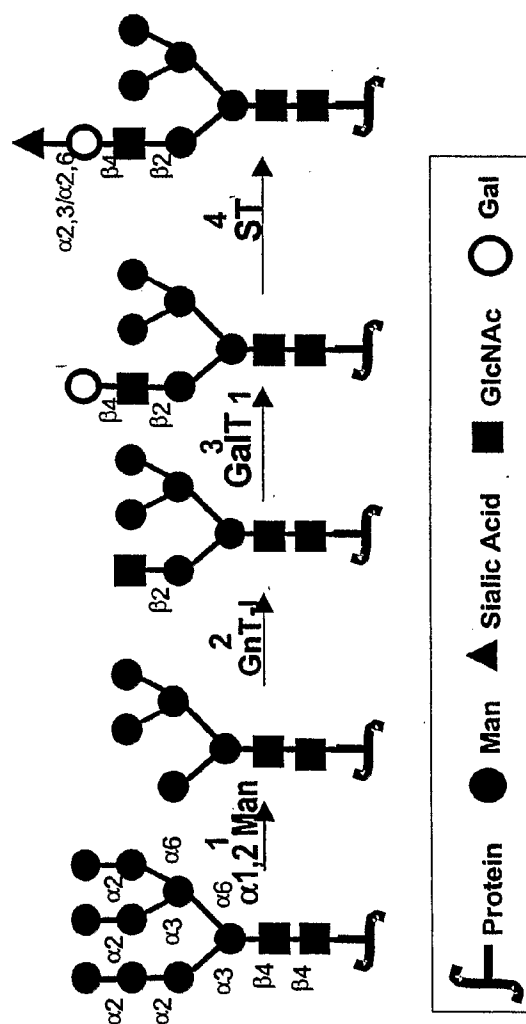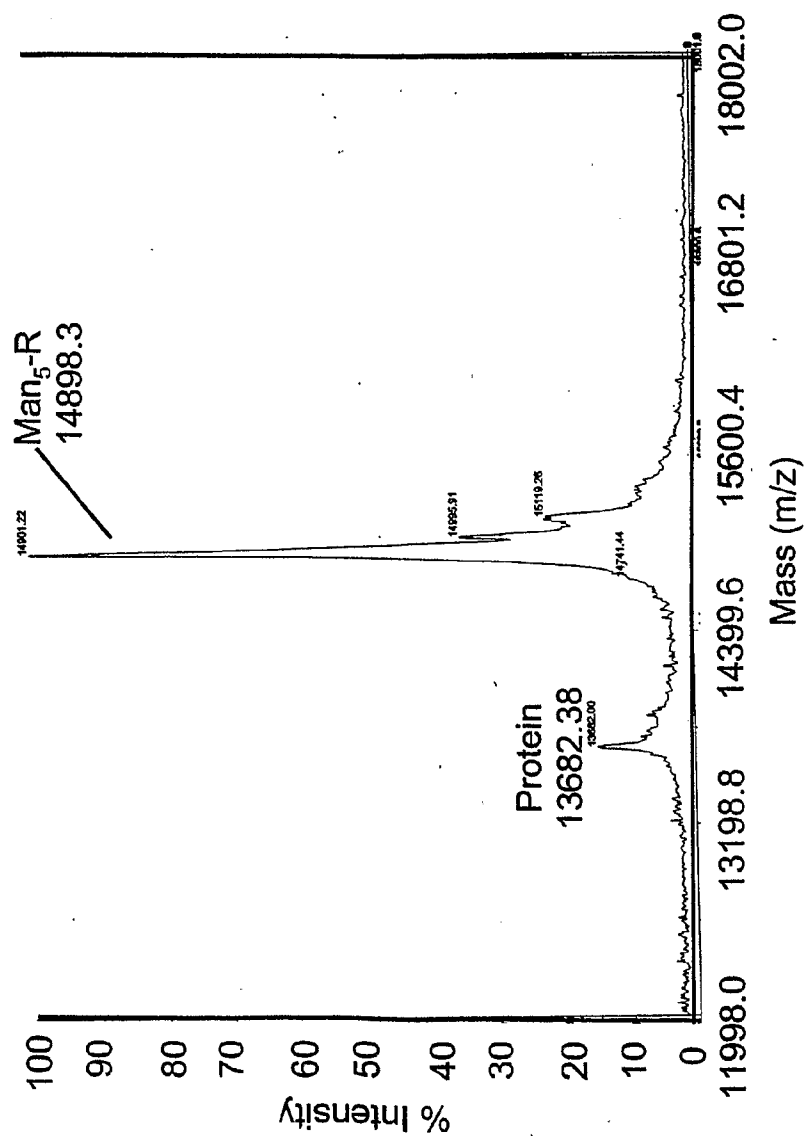
FIG. 181

FIG. 182A

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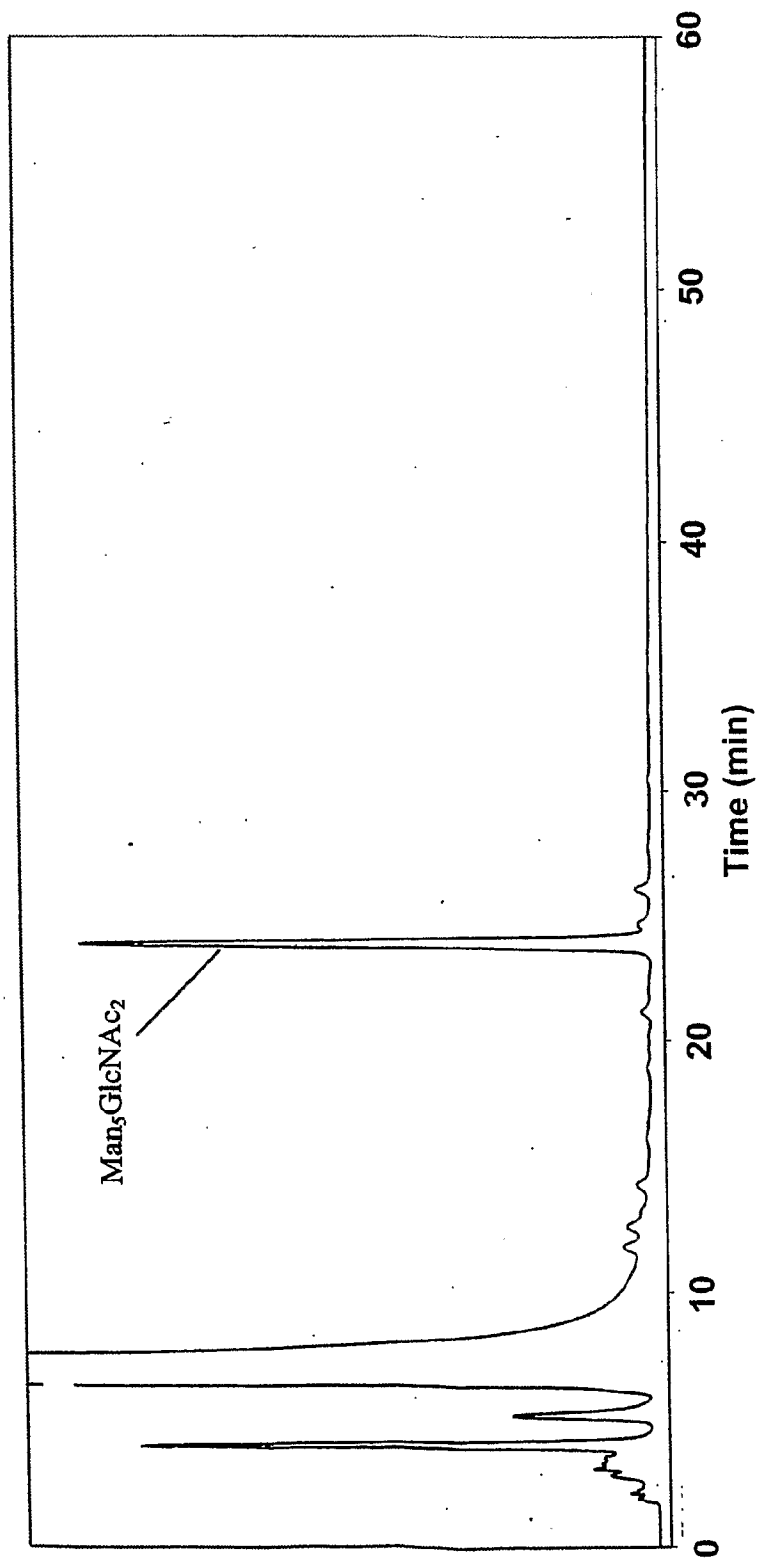


FIG. 182B

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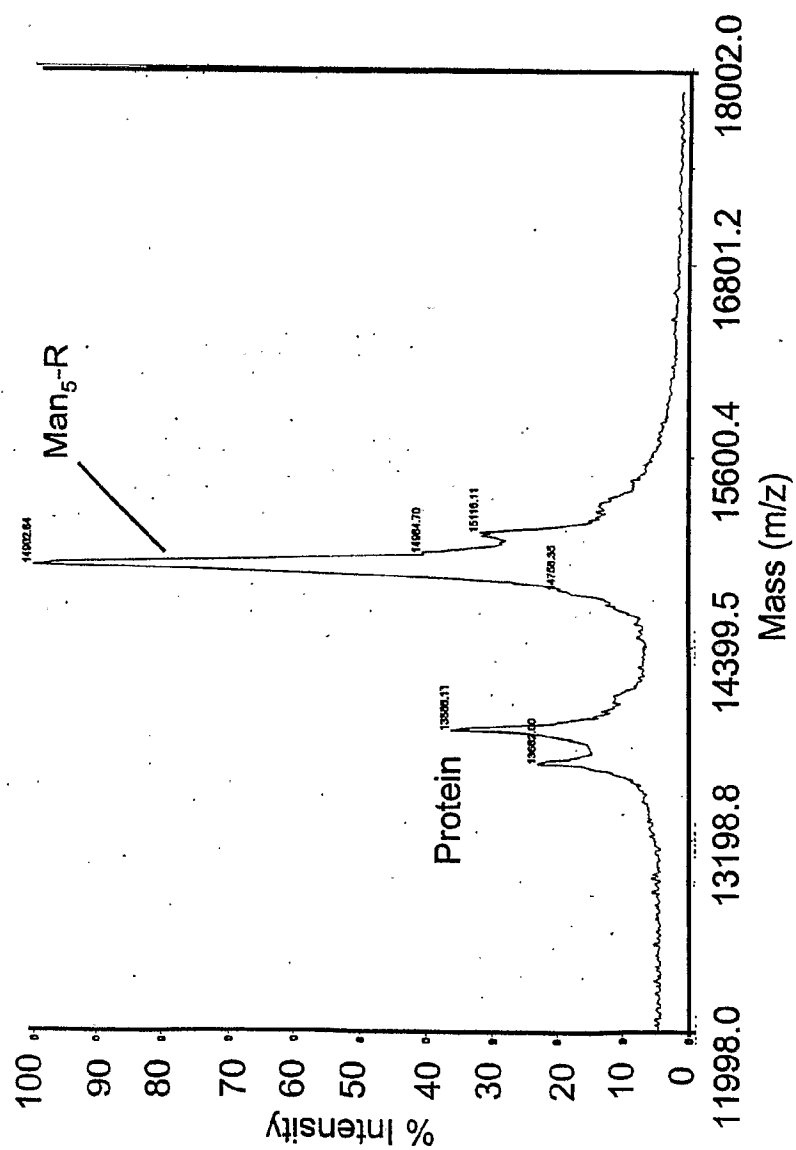


FIG. 183
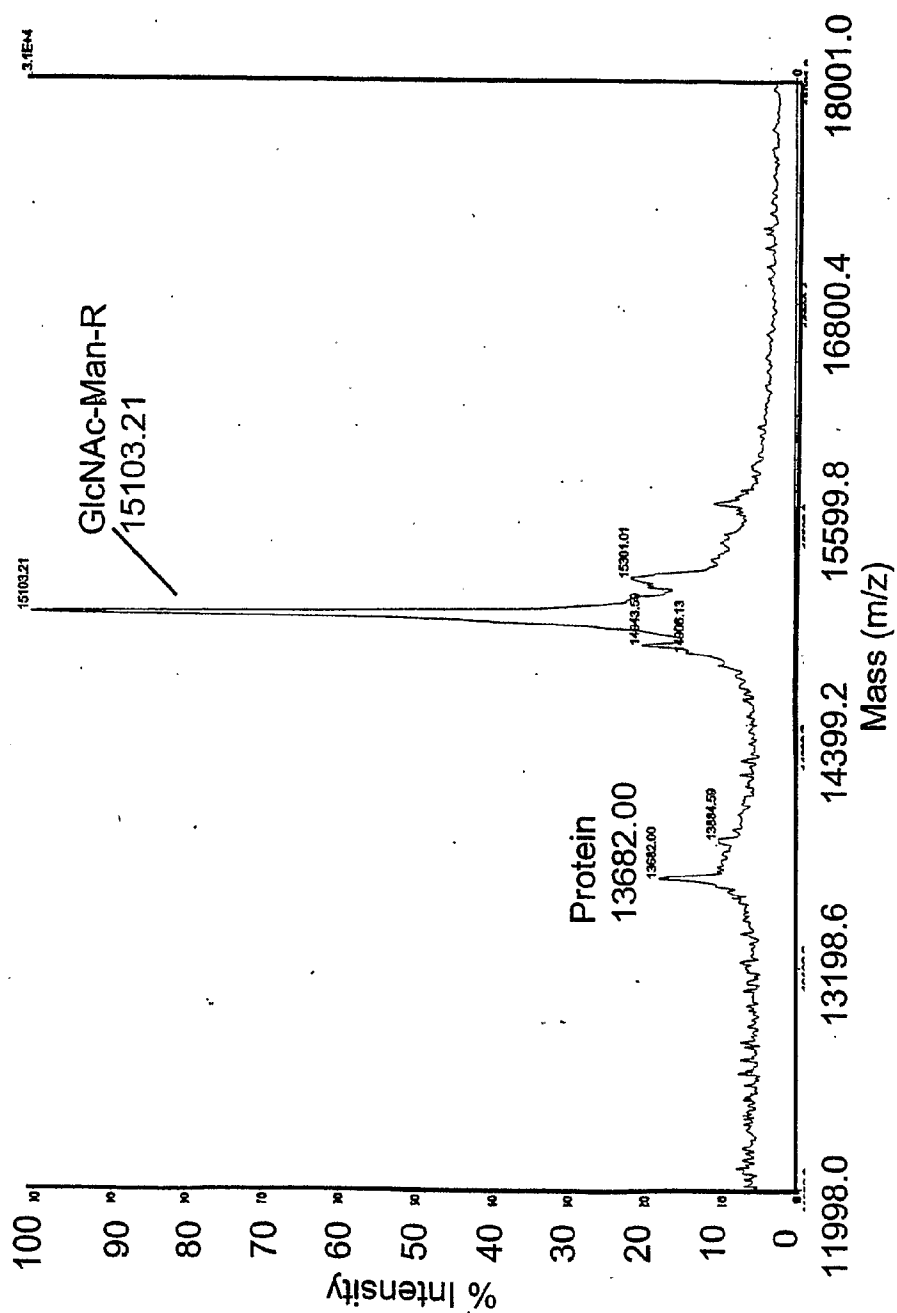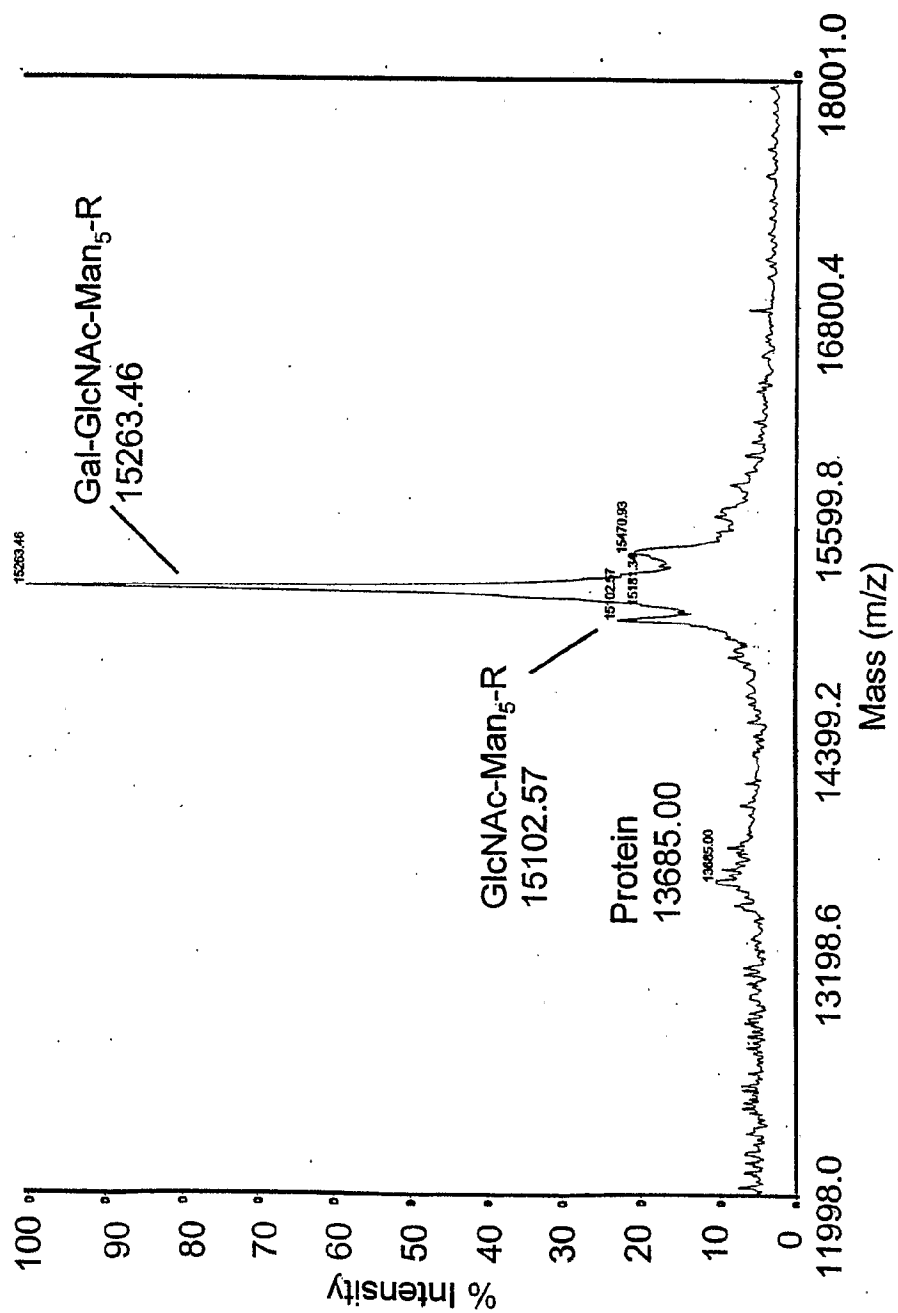
FIG. 184

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FIG. 185
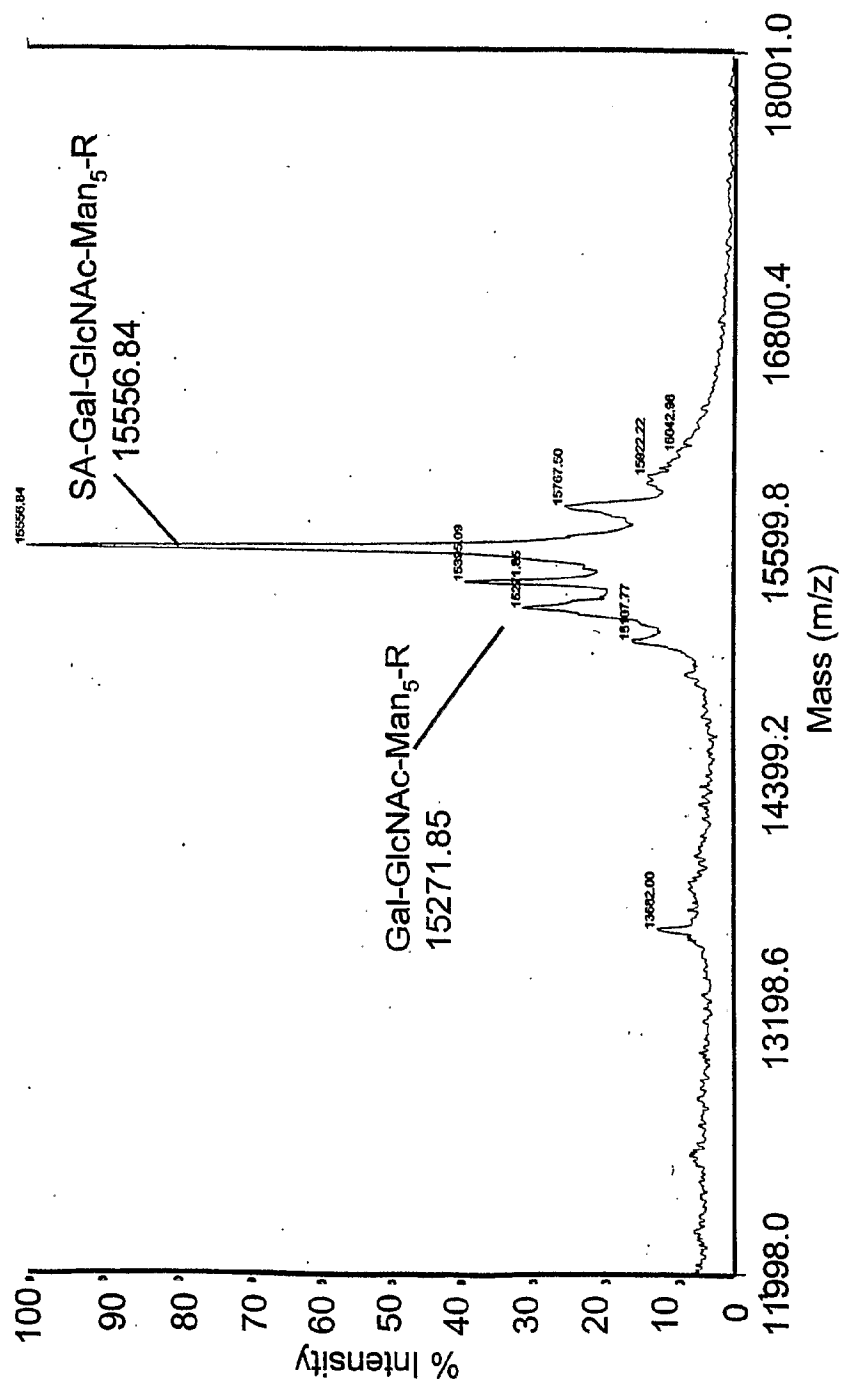
FIG. 186

CMP-SA-PEG (10K)

PEG-SA-Gal-GlcNAc-Man-R
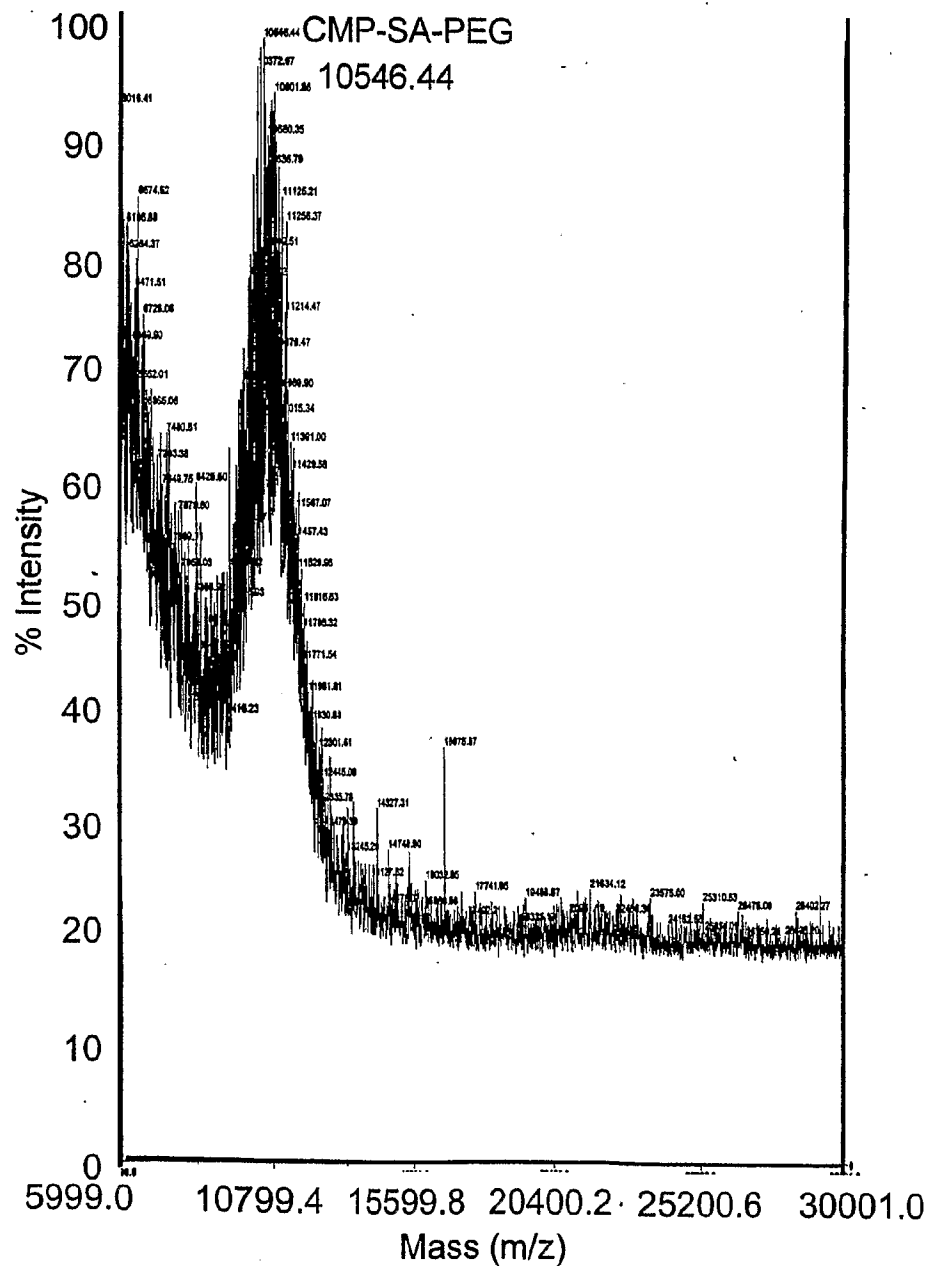
FIG. 187A

FIG. 187B
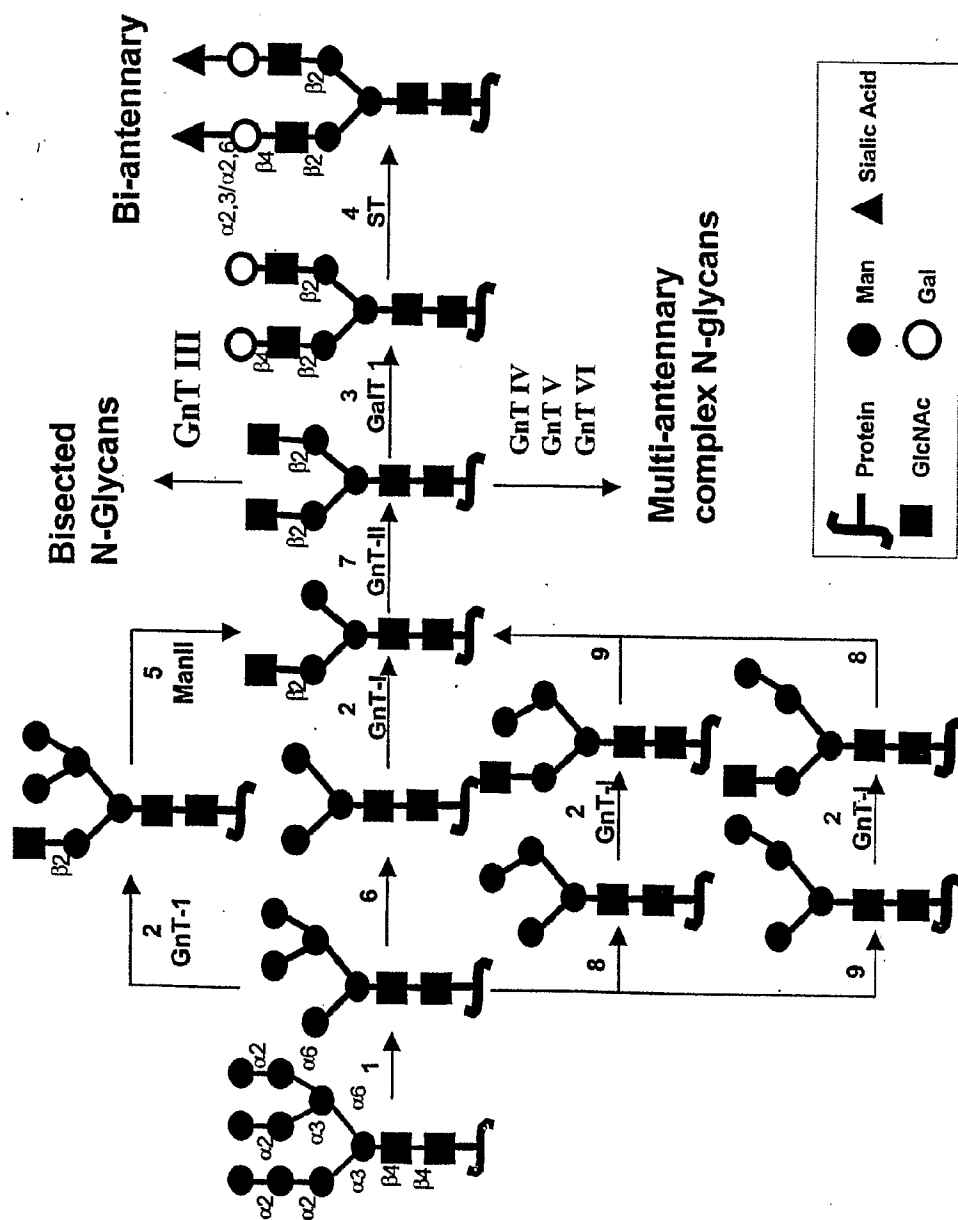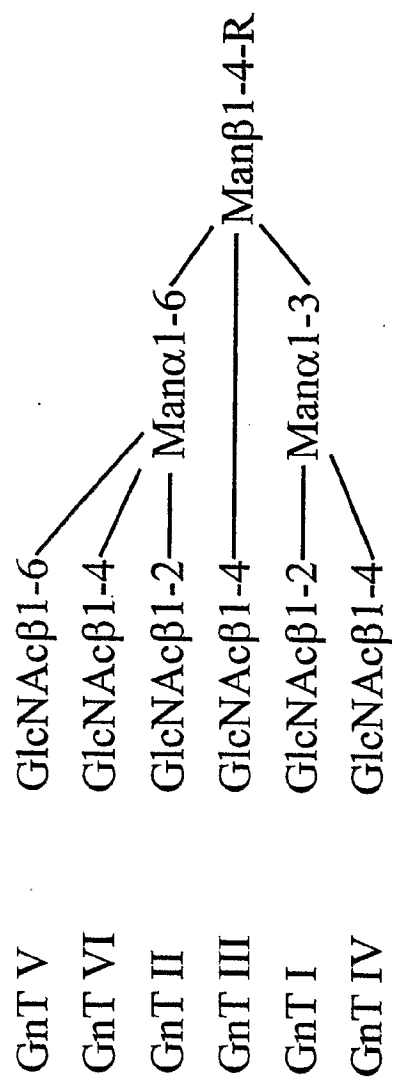
FIG. 188

FIG. 189
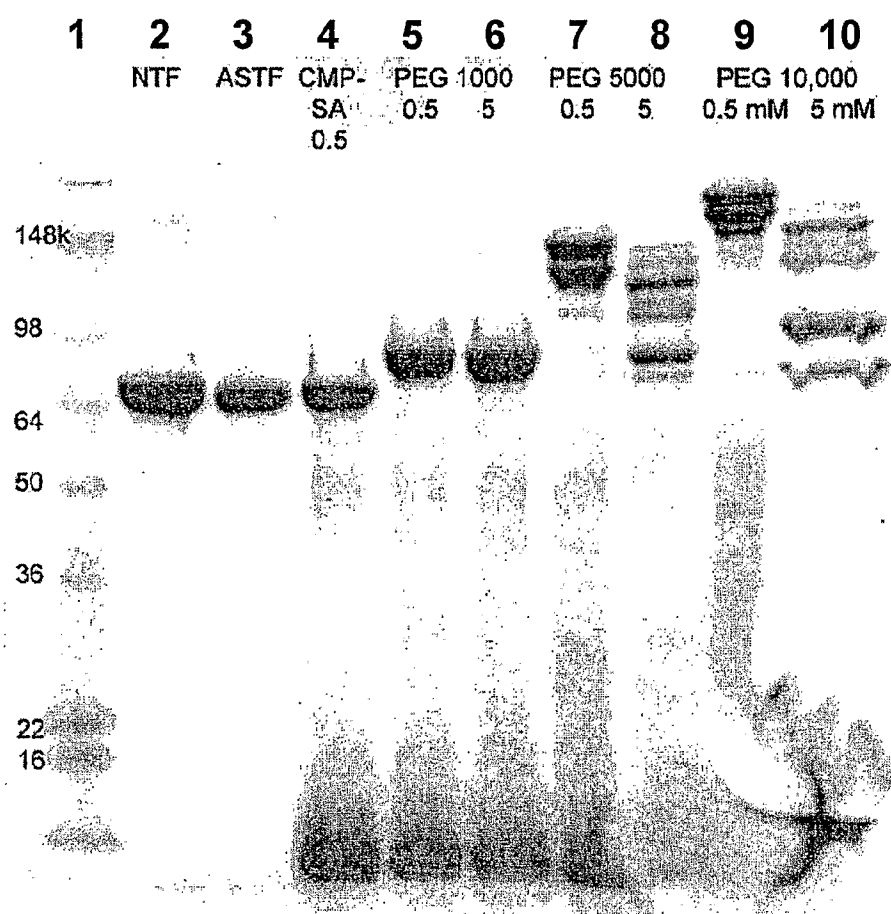
FIG. 190

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FIG. 191

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Fig. 192

Hemoglobin response in rats
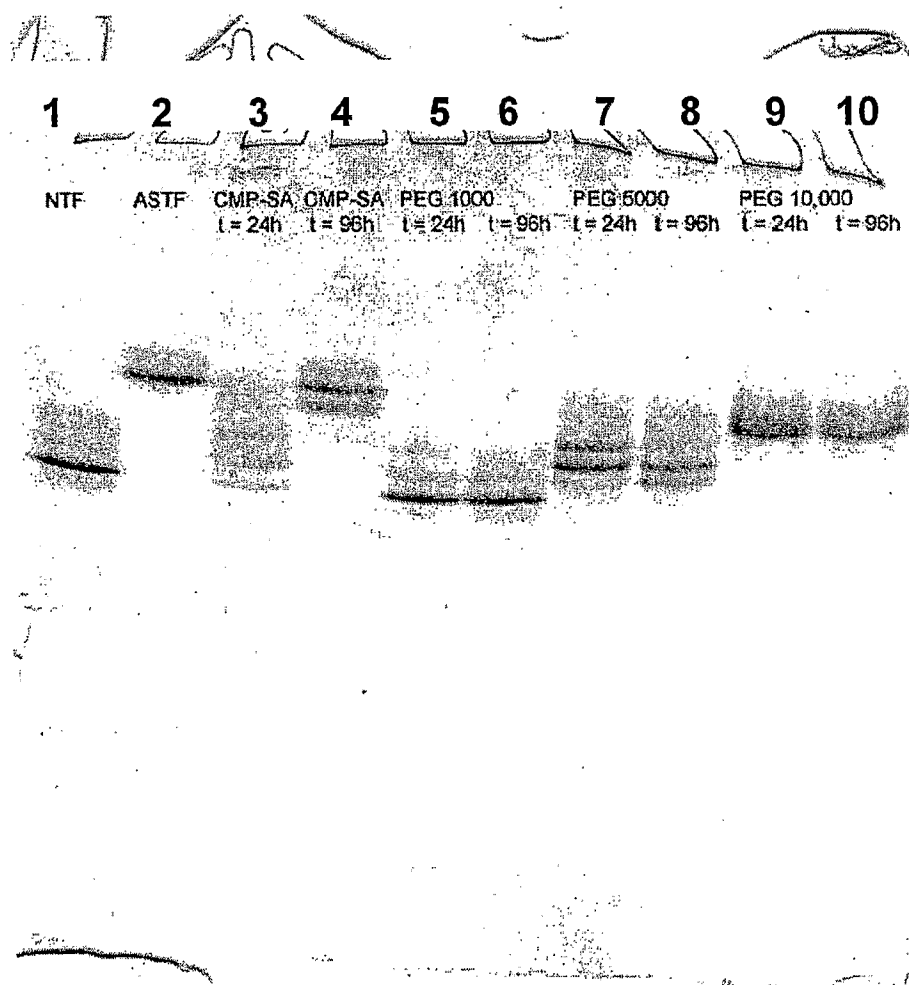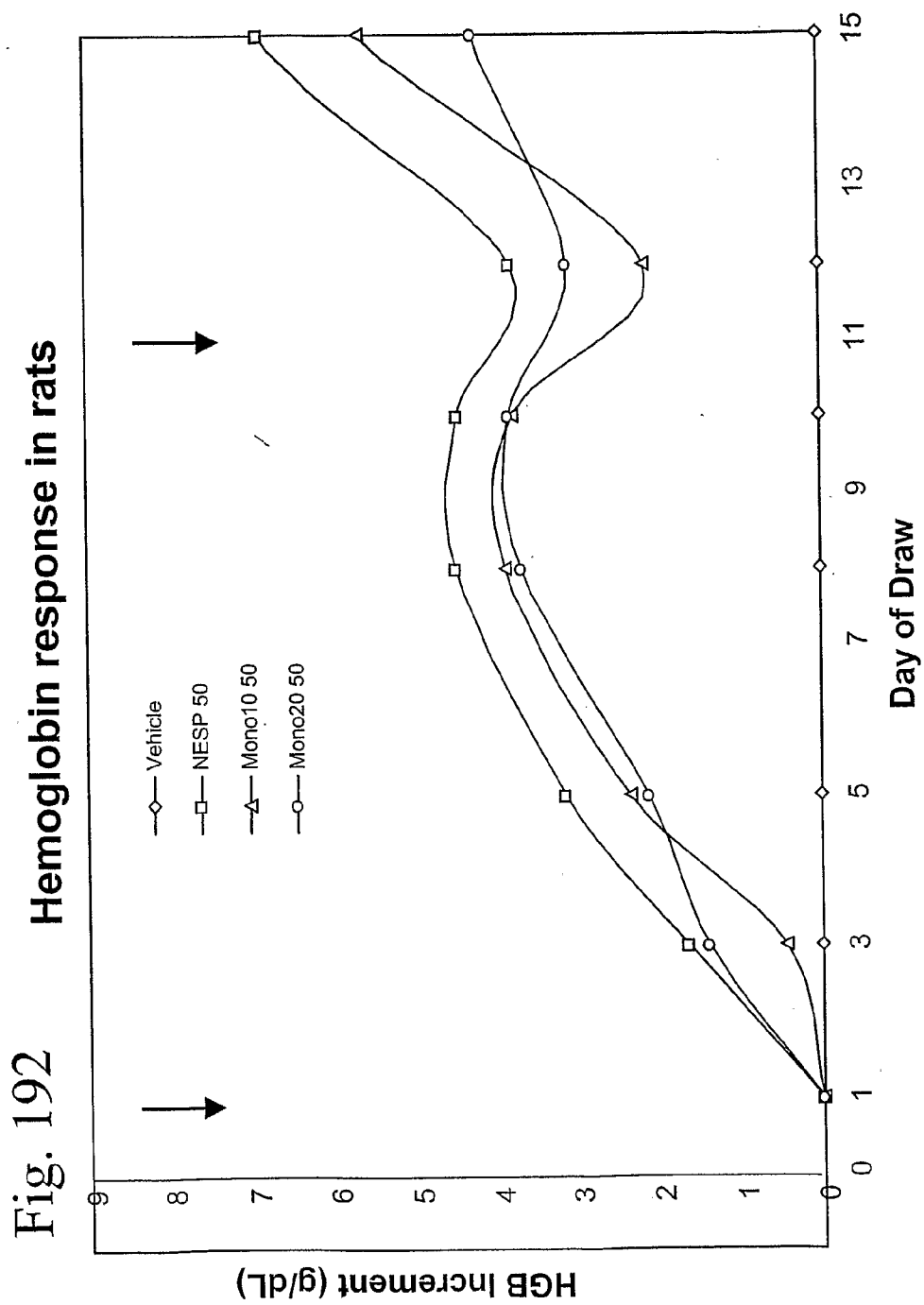
SEQUENCE LISTING

<110>  Neose Technologies, Inc.
       DeFrees, Shawn
       Zopf, David
       Bayer, Robert
       Hakes, David
       Chen, Xi
       Bowe, Caryne

<120>  ERYTHROPOIETIN: REMODELING AND GLYCOCONJUGATION OF
       ERYTHROPOIETIN

<130>  040853-01-5083WO

<150>  PCT/US02/32263
<151>  2002-10-09

<150>  US 10/287,994
<151>  2002-11-5

<150>  US 10/360,770
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<150>  US 10/369,779
<151>  2003-03-17

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<213>  Homo sapiens

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ctgtgccacc ccgaggagct ggtgctgctc ggacactctc tgggcatccc ctgggctccc   180

ctgagcagct gccccagcca ggccctgcag ctggcaggct gcttgagcca actccatagc   240

ggcctttttcc tctaccaggg gctcctgcag gccctggaag ggatctcccc cgagttgggt   300

cccaccttgg acacactgca gctggacgtc gccgactttg ccaccaccat ctggcagcag   360

atggaagaac tgggaatggc ccctgccctg cagcccaccc agggtgccat gccggccttc   420

gcctctgctt ccagcgccg ggcaggaggg gtcctggttg cctcccatct gcagagcttc   480

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<212>  PRT

<213> Homo sapiens

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Thr Pro Leu Gly Pro Ala Ser Ser Leu Pro Gln Ser Phe Leu Leu Lys
1               5                   10                  15

Cys Leu Glu Gln Val Arg Lys Ile Gln Gly Asp Gly Ala Ala Leu Gln
            20                  25                  30

Glu Lys Leu Cys Ala Thr Tyr Lys Leu Cys His Pro Glu Glu Leu Val
        35                  40                  45

Leu Leu Gly His Ser Leu Gly Ile Pro Trp Ala Pro Leu Ser Ser Cys
    50                  55                  60

Pro Ser Gln Ala Leu Gln Leu Ala Gly Cys Leu Ser Gln Leu His Ser
65                  70                  75                  80

Gly Leu Phe Leu Tyr Gln Gly Leu Leu Gln Ala Leu Glu Gly Ile Ser
                85                  90                  95

Pro Glu Leu Gly Pro Thr Leu Asp Thr Leu Gln Leu Asp Val Ala Asp
            100                 105                 110

Phe Ala Thr Thr Ile Trp Gln Gln Met Glu Glu Leu Gly Met Ala Pro
        115                 120                 125

Ala Leu Gln Pro Thr Gln Gly Ala Met Pro Ala Phe Ala Ser Ala Phe
    130                 135                 140

Gln Arg Arg Ala Gly Gly Val Leu Val Ala Ser His Leu Gln Ser Phe
145                 150                 155                 160

Leu Glu Val Ser Tyr Arg Val Leu Arg His Leu Ala Gln Pro
                165                 170

<210> 3
<211> 1733
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<213> Homo sapiens

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tgcaataata aacattaac tttatacttt ttaatttaat gtatagaata gagatataca      180

taggatatgt aaatagatac acagtgtata tgtgattaaa atataatggg agattcaatc     240

agaaaaaagt ttctaaaaag gctctggggt aaaagaggaa ggaaacaata atgaaaaaaa     300

tgtggtgaga aaacagctg aaaacccatg taaagagtgt ataaagaaag caaaaagaga     360

agtagaaagt aacacagggg catttggaaa atgtaaacga gtatgttccc tatttaaggc     420

taggcacaaa gcaaggtctt cagagaacct ggagcctaag gtttaggctc acccatttca     480

accagtctag cagcatctgc aacatctaca atggccttga cctttgcttt actggtggcc     540

ctcctggtgc tcagctgcaa gtcaagctgc tctgtgggct gtgatctgcc tcaaacccac     600

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tcctgcttga aggacagaca tgactttgga tttccccagg aggagtttgg caaccagttc    720

caaaaggctg aaaccatccc tgtcctccat gagatgatcc agcagatctt caatctcttc    780

agcacaaagg actcatctgc tgcttgggat gagaccctcc tagacaaatt ctacactgaa    840

ctctaccagc agctgaatga cctggaagcc tgtgtgatac agggggtggg ggtgacagag    900

actcccctga tgaaggagga ctccattctg ctgtgagga aatacttcca aagaatcact    960

ctctatctga agagaagaa atacagccct tgtgcctggg aggttgtcag agcagaaatc   1020

atgagatctt tttctttgtc aacaaacttg caagaaagtt taagaagtaa ggaatgaaaa   1080

ctggttcaac atggaaatga ttttcattga ttcgtatgcc agctcacctt tttatgatct   1140

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tttttaggag tattaatcaa cattgtattc agctcttaag gcactagtcc cttacagagg   1260

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ctatggaact tttgtacttg tttattcttt aaaatgaaat tccaagccta attgtgcaac   1500

ctgattacag aataactggt acacttcatt tgtccatcaa tattatattc aagatataag   1560

taaaaataaa ctttctgtaa accaagttgt atgttgtact caagataaca gggtgaacct   1620

aacaaataca attctgctct cttgtgtatt tgattttttgt atgaaaaaaa ctaaaaatgg   1680

taatcatact taattatcag ttatggtaaa tggtatgaag agaagaagga acg          1733
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<213>    Homo sapiens

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Lys Ser Ser Cys Ser Val Gly Cys Asp Leu Pro Gln Thr His Ser Leu
            20                  25                  30

Gly Ser Arg Arg Thr Leu Met Leu Leu Ala Gln Met Arg Arg Ile Ser
        35                  40                  45

Leu Phe Ser Cys Leu Lys Asp Arg His Asp Phe Gly Phe Pro Gln Glu
    50                  55                  60

Glu Phe Gly Asn Gln Phe Gln Lys Ala Glu Thr Ile Pro Val Leu His
65                  70                  75                  80

Glu Met Ile Gln Gln Ile Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser
```

```
              85                   90                   95
Ala Ala Trp Asp Glu Thr Leu Leu Asp Lys Phe Tyr Thr Glu Leu Tyr
            100                 105                 110

Gln Gln Leu Asn Asp Leu Glu Ala Cys Val Ile Gln Gly Val Gly Val
            115                 120                 125

Thr Glu Thr Pro Leu Met Lys Glu Asp Ser Ile Leu Ala Val Arg Lys
        130                 135                 140

Tyr Phe Gln Arg Ile Thr Leu Tyr Leu Lys Glu Lys Lys Tyr Ser Pro
145                 150                 155                 160

Cys Ala Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser Leu
            165                 170                 175

Ser Thr Asn Leu Gln Glu Ser Leu Arg Ser Lys Glu
            180                 185
```

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<210> 5
<211> 757
<212> DNA
<213> Homo sapiens

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ctcctgtggc aattgaatgg gaggcttgaa tattgcctca aggacaggat gaactttgac   180

atccctgagg agattaagca gctgcagcag ttccagaagg aggacgccgc attgaccatc   240

tatgagatgc tccagaacat ctttgctatt ttcagacaag attcatctag cactggctgg   300

aatgagacta ttgttgagaa cctcctggct aatgtctatc atcagataaa ccatctgaag   360

acagtcctgg aagaaaaact ggagaaagaa gattttacca ggggaaaact catgagcagt   420

ctgcacctga aaagatatta tgggaggatt ctgcattacc tgaaggccaa ggagtacagt   480

cactgtgcct ggaccatagt cagagtggaa atcctaagga acttttactt cattaacaga   540

cttacaggtt acctccgaaa ctgaagatct cctagcctgt ccctctggga ctggacaatt   600

gcttcaagca ttcttcaacc agcagatgct gtttaagtga ctgatggcta atgtactgca   660

aatgaaagga cactagaaga ttttgaaatt tttattaaat tatgagttat ttttatttat   720

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<212> PRT
<213> Homo sapiens

<400> 6
Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
1               5                   10                  15
```

```
Thr Thr Ala Leu Ser Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg
            20                  25                  30

Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg
            35                  40                  45

Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu
            50                  55                  60

Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile
65                  70                  75                  80

Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser
                85                  90                  95

Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val
                100                 105                 110

Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu
            115                 120                 125

Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys
            130                 135                 140

Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser
145                 150                 155                 160

His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr
                165                 170                 175

Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn
                180                 185

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<213>   Homo sapiens

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gcgttcctgg aggagctgcg gccgggctcc ctggagaggg agtgcaagga ggagcagtgc    180

tccttcgagg aggcccggga gatcttcaag gacgcggaga ggacgaagct gttctggatt    240

tcttacagtg atggggacca gtgtgcctca gtccatgcc agaatggggg ctcctgcaag    300

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agtgaccaca cgggcaccaa gcgctcctgt cggtgccacg aggggtactc tctgctggca    480

gacggggtgt cctgcacacc cacagttgaa tatccatgtg aaaaatacc tattctagaa    540

aaaagaaatg ccagcaaacc ccaaggccga attgtggggg caaggtgtg ccccaaaggg    600

gagtgtccat ggcaggtcct gttgttggtg aatggagctc agttgtgtgg ggggaccctg    660
```

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atcaacacca tctgggtggt ctccgcggcc cactgtttcg acaaaatcaa gaactggagg       720

aacctgatcg cggtgctggg cgagcacgac ctcagcgagc acgacgggga tgagcagagc       780

cggcgggtgg cgcaggtcat catccccagc acgtacgtcc cgggcaccac caaccacgac       840

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gccccatttc cc                                                         1332
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<211>   444
<212>   PRT
<213>   Homo sapiens

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1               5                   10                  15
Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
                20              25                  30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
            35                  40                  45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
        50                  55                  60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65                  70                  75                  80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
                85                  90                  95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
            100                 105                 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
        115                 120                 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
    130                 135                 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145                 150                 155                 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
                165                 170                 175
```

6

```
Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
        180             185             190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
        195             200             205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
    210             215             220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
225             230             235             240

Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly
            245             250             255

Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr
        260             265             270

Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln
        275             280             285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
    290             295             300

Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
305             310             315             320

Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
            325             330             335

Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
        340             345             350

Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
        355             360             365

Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
    370             375             380

Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
385             390             395             400

Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
            405             410             415

Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
        420             425             430

Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro
        435             440
```

```
<210>   9
<211>   1437
<212>   DNA
<213>   Homo sapiens

<400>   9
atgcagcgcg tgaacatgat catggcagaa tcaccaagcc tcatcaccat ctgcctttta    60

ggatatctac tcagtgctga atgtacagtt tttcttgatc atgaaacgc caacaaaatt    120
```

                                    7

```
ctgaatcggc caaagaggta taattcaggt aaattggaag agtttgttca agggaacctt    180

gagagagaat gtatggaaga aaagtgtagt tttgaagaac cacgagaagt ttttgaaaac    240

actgaaaaga caactgaatt ttggaagcag tatgttgatg gagatcagtg tgagtccaat    300

ccatgtttaa atggcggcag ttgcaaggat gacattaatt cctatgaatg ttggtgtccc    360

tttggatttg aaggaaagaa ctgtgaatta gatgtaacat gtaacattaa gaatggcaga    420

tgcgagcagt tttgtaaaaa tagtgctgat aacaaggtgg tttgctcctg tactgaggga    480

tatcgacttg cagaaaacca gaagtcctgt gaaccagcag tgccatttcc atgtggaaga    540

gtttctgttt cacaaacttc taagctcacc cgtgctgagg ctgtttttcc tgatgtggac    600

tatgtaaatc ctactgaagc tgaaaccatt ttggataaca tcactcaagg cacccaatca    660

tttaatgact tcactcgggt tgttggtgga gaagatgcca aaccaggtca attcccttgg    720

caggttgttt tgaatggtaa agttgatgca ttctgtggag gctctatcgt taatgaaaaa    780

tggattgtaa ctgctgccca ctgtgttgaa actggtgtta aaattacagt tgtcgcaggt    840

gaacataata ttgaggagac agaacataca gagcaaaagc gaaatgtgat tcgagcaatt    900

attcctcacc acaactacaa tgcagctatt aataagtaca accatgacat tgcccttctg    960

gaactggacg aacccttagt gctaaacagc tacgttacac ctatttgcat tgctgacaag   1020

gaatacacga acatcttcct caaatttgga tctggctatg taagtggctg ggcaagagtc   1080

ttccacaaag ggagatcagc tttagttctt cagtacctta gagttccact tgttgaccga   1140

gccacatgtc ttcgatctac aaagttcacc atctataaca acatgttctg tgctggcttc   1200

catgaaggag gtagagattc atgtcaagga gatagtgggg gacccccatgt tactgaagtg   1260

gaagggacca gtttcttaac tggaattatt agctggggtg aagagtgtgc aatgaaaggc   1320

aaatatggaa tatataccaa ggtatcccgg tatgtcaact ggattaagga aaaaacaaag   1380

ctcacttaat gaaagatgga tttccaaggt taattcattg gaattgaaaa ttaacag      1437
```

<210>   10
<211>   462
<212>   PRT
<213>   Homo sapiens

<400>   10
Met Gln Arg Val Asn Met Ile Met Ala Glu Ser Pro Ser Leu Ile Thr
1               5                  10                  15

Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu
            20                  25                  30

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
        35                  40                  45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys

```
        50                      55                      60

Met Glu Glu Lys Cys Ser Phe Glu Glu Pro Arg Glu Val Phe Glu Asn
65                  70                  75                  80

Thr Glu Lys Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
                85                  90                  95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
            100                 105                 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
            115                 120                 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
    130                 135                 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
145                 150                 155                 '160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
            165                 170                 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
            180                 185                 190

Glu Ala Val Phe Pro Asp Val Asp Tyr Val Asn Pro Thr Glu Ala Glu
        195                 200                 205

Thr Ile Leu Asp Asn Ile Thr Gln Gly Thr Gln Ser Phe Asn Asp Phe
    210                 215                 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
225                 230                 235                 240

Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
            245                 250                 255

Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
            260                 265                 270

Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
        275                 280                 285

His Thr Glu Gln Lys Arg Asn Val Ile Arg Ala Ile Ile Pro His His
    290                 295                 300

Asn Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu
305                 310                 315                 320

Glu Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys
            325                 330                 335

Ile Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly
            340                 345                 350

Tyr Val Ser Gly Trp Ala Arg Val Phe His Lys Gly Arg Ser Ala Leu
        355                 360                 365

Val Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu
    370                 375                 380
```

9

```
Arg Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe
385                 390                 395                 400

His Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His
                405                 410                 415

Val Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp
            420                 425                 430

Gly Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val
        435                 440                 445

Ser Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr
    450                 455                 460
```

```
<210>    11
<211>    603
<212>    DNA
<213>    Homo sapiens

<400>    11
atggattact acagaaaata tgcagctatc tttctggtca cattgtcggt gtttctgcat    60

gttctccatt ccgctcctga tgtgcaggat tgcccagaat gcacgctaca ggaaaaccca   120

ttcttctccc agccgggtgc cccaatactt cagtgcatgg gctgctgctt ctctagagca   180

tatcccactc cactaaggtc caagaagacg atgttggtcc aaaagaacgt cacctcagag   240

tccacttgct gtgtagctaa atcatataac agggtcacag taatgggggg tttcaaagtg   300

gagaaccaca cggcgtgcca ctgcagtact tgttattatc acaaatctta aatgttttac   360

caagtgctgt cttgatgact gctgattttc tggaatggaa aattaagttg tttagtgttt   420

atggctttgt gagataaaac tctcctttc cttaccatac cactttgaca cgcttcaagg   480

atatactgca gctttactgc cttcctcctt atcctacagt acaatcagca gtctagttct   540

tttcatttgg aatgaataca gcattaagct tgttccactg caaataaagc cttttaaatc   600

atc                                                                 603
```

```
<210>    12
<211>    116
<212>    PRT
<213>    Homo sapiens

<400>    12
Met Asp Tyr Tyr Arg Lys Tyr Ala Ala Ile Phe Leu Val Thr Leu Ser
1               5                   10                  15

Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro
            20                  25                  30

Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro
        35                  40                  45

Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro
    50                  55                  60
```

```
Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu
65              70              75              80

Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly
            85              90              95

Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr
        100             105             110

Tyr His Lys Ser
        115
```

<210>    13
<211>    390
<212>    DNA
<213>    Homo sapiens

<400>    13
```
atgaagacac tccagttttt cttccttttc tgttgctgga aagcaatctg ctgcaatagc     60

tgtgagctga ccaacatcac cattgcaata gagaaagaag aatgtcgttt ctgcataagc    120

atcaacacca cttggtgtgc tggctactgc tacaccaggg atctggtgta taaggaccca    180

gccaggccca aaatccagaa aacatgtacc ttcaaggaac tggtatatga aacagtgaga    240

gtgcccggct gtgctcacca tgcagattcc ttgtatacat acccagtggc cacccagtgt    300

cactgtggca agtgtgacag cgacagcact gattgtactg tgcgaggcct ggggcccagc    360

tactgctcct ttggtgaaat gaaagaataa                                     390
```

<210>    14
<211>    129
<212>    PRT
<213>    Homo sapiens

<400>    14
```
Met Lys Thr Leu Gln Phe Phe Phe Leu Phe Cys Cys Trp Lys Ala Ile
1               5              10              15

Cys Cys Asn Ser Cys Glu Leu Thr Asn Ile Thr Ile Ala Ile Glu Lys
            20              25              30

Glu Glu Cys Arg Phe Cys Ile Ser Ile Asn Thr Thr Trp Cys Ala Gly
        35              40              45

Tyr Cys Tyr Thr Arg Asp Leu Val Tyr Lys Asp Pro Ala Arg Pro Lys
    50              55              60

Ile Gln Lys Thr Cys Thr Phe Lys Glu Leu Val Tyr Glu Thr Val Arg
65              70              75              80

Val Pro Gly Cys Ala His His Ala Asp Ser Leu Tyr Thr Tyr Pro Val
            85              90              95

Ala Thr Gln Cys His Cys Gly Lys Cys Asp Ser Asp Ser Thr Asp Cys
        100             105             110

Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe Gly Glu Met Lys
```

            115                        120                        125

Glu

<210>  15
<211>  1342
<212>  DNA
<213>  Homo sapiens

<400>  15
cccggagccg gaccggggcc accgcgcccg ctctgctccg acaccgcgcc ccctggacag       60

ccgccctctc ctccaggccc gtggggctgg ccctgcaccg ccgagcttcc cgggatgagg      120

gccccccggtg tggtcacccg gcgcgcccca ggtcgctgag ggaccccggc caggcgcgga      180

gatggggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc      240

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga      300

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg      360

cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag      420

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc      480

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct      540

gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctgcg      600

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat      660

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct      720

gaagctgtac acaggggagg cctgcaggac aggggacaga tgaccaggtg tgtccacctg      780

ggcatatcca ccacctccct caccaacatt gcttgtgcca caccctcccc cgccactcct      840

gaaccccgtc gaggggctct cagctcagcg ccagcctgtc ccatggacac tccagtgcca      900

gcaatgacat ctcaggggcc agaggaactg tccagagagc aactctgaga tctaaggatg      960

tcacagggcc aacttgaggg cccagagcag gaagcattca gagagcagct ttaaactcag     1020

ggacagagcc atgctgggaa gacgcctgag ctcactcggc accctgcaaa atttgatgcc     1080

aggacacgct ttggaggcga tttacctgtt ttcgcaccta ccatcaggga caggatgacc     1140

tggagaactt aggtggcaag ctgtgacttc tccaggtctc acgggcatgg gcactccctt     1200

ggtggcaaga gccccttga caccggggtg gtgggaacca tgaagacagg atggggggctg     1260

gcctctggct ctcatggggt ccaagttttg tgtattcttc aacctcattg acaagaactg     1320

aaaccaccaa aaaaaaaaaa aa                                              1342

<210>  16
<211>  193
<212>  PRT
<213>  Homo sapiens

<400> 16

```
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1               5               10              15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
            20              25              30

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
        35              40              45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
    50              55              60

Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65              70              75              80

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
            85              90              95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
        100             105             110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
    115             120             125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Arg Ala Gln Lys Glu
    130             135             140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145             150             155             160

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
            165             170             175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
            180             185             190

Arg
```

<210> 17
<211> 435
<212> DNA
<213> Homo sapiens

<400> 17

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atgtggctgc agagcctgct gctcttgggc actgtggcct gcagcatctc tgcacccgcc    60

cgctcgccca gccccagcac gcagccctgg gagcatgtga atgccatcca ggaggcccgg   120

cgtctcctga acctgagtag agacactgct gctgagatga atgaaacagt agaagtcatc   180

tcagaaatgt ttgacctcca ggagccgacc tgcctacaga cccgcctgga gctgtacaag   240

cagggcctgc ggggcagcct caccaagctc aagggcccct tgaccatgat ggccagccac   300

tacaagcagc actgccctcc aaccccggaa acttcctgtg caacccagat tatcaccttt   360

gaaagtttca aagagaacct gaaggacttt ctgcttgtca tcccctttga ctgctgggag   420
```

ccagtccagg agtga

<210> 18
<211> 144
<212> PRT
<213> Homo sapiens

<400> 18
Met Trp Leu Gln Ser Leu Leu Leu Leu Gly Thr Val Ala Cys Ser Ile
1               5                   10                  15

Ser Ala Pro Ala Arg Ser Pro Ser Pro Ser Thr Gln Pro Trp Glu His
            20                  25                  30

Val Asn Ala Ile Gln Glu Ala Arg Arg Leu Leu Asn Leu Ser Arg Asp
        35                  40                  45

Thr Ala Ala Glu Met Asn Glu Thr Val Glu Val Ile Ser Glu Met Phe
    50                  55                  60

Asp Leu Gln Glu Pro Thr Cys Leu Gln Thr Arg Leu Glu Leu Tyr Lys
65                  70                  75                  80

Gln Gly Leu Arg Gly Ser Leu Thr Lys Leu Lys Gly Pro Leu Thr Met
                85                  90                  95

Met Ala Ser His Tyr Lys Gln His Cys Pro Pro Thr Pro Glu Thr Ser
            100                 105                 110

Cys Ala Thr Gln Ile Ile Thr Phe Glu Ser Phe Lys Glu Asn Leu Lys
        115                 120                 125

Asp Phe Leu Leu Val Ile Pro Phe Asp Cys Trp Glu Pro Val Gln Glu
    130                 135                 140

<210> 19
<211> 501
<212> DNA
<213> Homo sapiens

<400> 19
atgaaatata caagttatat cttggctttt cagctctgca tcgttttggg ttctcttggc      60

tgttactgcc aggacccata tgtaaaagaa gcagaaaacc ttaagaaata ttttaatgca     120

ggtcattcag atgtagcgga taatggaact cttttcttag gcattttgaa gaattggaaa     180

gaggagagtg acagaaaaat aatgcagagc caaattgtct ccttttactt caaacttttt     240

aaaaacttta agatgacca gagcatccaa aagagtgtgg agaccatcaa ggaagacatg     300

aatgtcaagt ttttcaatag caacaaaaag aaacgagatg acttcgaaaa gctgactaat     360

tattcggtaa ctgacttgaa tgtccaacgc aaagcaatac atgaactcat ccaagtgatg     420

gctgaactgt cgccagcagc taaaacaggg aagcgaaaaa ggagtcagat gctgtttcga     480

ggtcgaagag catcccagta a                                                501

<210> 20
<211> 166

<212> PRT
<213> Homo sapiens

<400> 20
Met Lys Tyr Thr Ser Tyr Ile Leu Ala Phe Gln Leu Cys Ile Val Leu
1               5                   10                  15

Gly Ser Leu Gly Cys Tyr Cys Gln Asp Pro Tyr Val Lys Glu Ala Glu
            20                  25                  30

Asn Leu Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn
        35                  40                  45

Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu Ser Asp
    50                  55                  60

Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe Lys Leu Phe
65                  70                  75                  80

Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser Val Glu Thr Ile
                85                  90                  95

Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser Asn Lys Lys Lys Arg
            100                 105                 110

Asp Asp Phe Glu Lys Leu Thr Asn Tyr Ser Val Thr Asp Leu Asn Val
        115                 120                 125

Gln Arg Lys Ala Ile His Glu Leu Ile Gln Val Met Ala Glu Leu Ser
    130                 135                 140

Pro Ala Ala Lys Thr Gly Lys Arg Lys Arg Ser Gln Met Leu Phe Arg
145                 150                 155                 160

Gly Arg Arg Ala Ser Gln
                165

<210> 21
<211> 1352
<212> DNA
<213> Homo sapiens

<400> 21
ctgggacagt gaatcgacaa tgccgtcttc tgtctcgtgg ggcatcctcc tgctggcagg      60

cctgtgctgc ctggtccctg tctccctggc tgaggatccc cagggagatg ctgcccagaa     120

gacagataca tcccaccatg atcaggatca cccaaccttc aacaagatca cccccaacct     180

ggctgagttc gccttcagcc tataccgcca gctggcacac cagtccaaca gcaccaatat     240

cttcttctcc ccagtgagca tcgctacagc ctttgcaatg ctctccctgg ggaccaaggc     300

tgacactcac gatgaaatcc tggagggcct gaatttcaac ctcacggaga ttccggaggc     360

tcagatccat gaaggcttcc aggaactcct ccgtaccctc aaccagccag acagccagct     420

ccagctgacc accggcaatg gcctgttcct cagcgagggc ctgaagctag tggataagtt     480

tttggaggat gttaaaaagt tgtaccactc agaagccttc actgtcaact cggggacac      540

```
cgaagaggcc aagaaacaga tcaacgatta cgtggagaag ggtactcaag ggaaaattgt    600

ggatttggtc aaggagcttg acagagacac agtttttgct ctggtgaatt acatcttctt    660

taaaggcaaa tgggagagac cctttgaagt caaggacacc gaggaagagg acttccacgt    720

ggaccaggtg accaccgtga aggtgcctat gatgaagcgt ttaggcatgt ttaacatcca    780

gcactgtaag aagctgtcca gctgggtgct gctgatgaaa tacctgggca atgccaccgc    840

catcttcttc ctgcctgatg aggggaaact acagcacctg aaaatgaac tcacccacga     900

tatcatcacc aagttcctgg aaaatgaaga cagaaggtct gccagcttac atttacccaa    960

actgtccatt actggaacct atgatctgaa gagcgtcctg ggtcaactgg gcatcactaa   1020

ggtcttcagc aatggggctg acctctccgg ggtcacagag gaggcacccc tgaagctctc   1080

caaggccgtg cataaggctg tgctgaccat cgacgagaaa gggactgaag ctgctggggc   1140

catgttttta gaggccatac ccatgtctat ccccccgag gtcaagttca acaaaccctt    1200

tgtcttctta atgattgaac aaaataccaa gtctcccctc ttcatgggaa aagtggtgaa   1260

tcccacccaa aaataactgc ctctcgctcc tcaacccctc ccctccatcc ctggcccoct   1320

ccctggatga cattaaagaa gggttgagct gg                                 1352
```

```
<210>  22
<211>  418
<212>  PRT
<213>  Homo sapiens

<400>  22
Met Pro Ser Ser Val Ser Trp Gly Ile Leu Leu Leu Ala Gly Leu Cys
1               5                   10                  15

Cys Leu Val Pro Val Ser Leu Ala Glu Asp Pro Gln Gly Asp Ala Ala
            20                  25                  30

Gln Lys Thr Asp Thr Ser His His Asp Gln Asp His Pro Thr Phe Asn
        35                  40                  45

Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe Ser Leu Tyr Arg Gln
    50                  55                  60

Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe Phe Ser Pro Val Ser
65                  70                  75                  80

Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly Thr Lys Ala Asp Thr
                85                  90                  95

His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn Leu Thr Glu Ile Pro
            100                 105                 110

Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu Leu Arg Thr Leu Asn
        115                 120                 125

Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly Asn Gly Leu Phe Leu
    130                 135                 140
```

Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu Glu Asp Val Lys Lys
145             150             155             160

Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe Gly Asp Thr Glu Glu
                165             170             175

Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys Gly Thr Gln Gly Lys
        180             185             190

Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp Thr Val Phe Ala Leu
        195             200             205

Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu Arg Pro Phe Glu Val
    210             215             220

Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp Gln Val Thr Thr Val
225             230             235             240

Lys Val Pro Met Met Lys Arg Leu Gly Met Phe Asn Ile Gln His Cys
            245             250             255

Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys Tyr Leu Gly Asn Ala
            260             265             270

Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys Leu Gln His Leu Glu
        275             280             285

Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe Leu Glu Asn Glu Asp
    290             295             300

Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu Ser Ile Thr Gly Thr
305             310             315             320

Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly Ile Thr Lys Val Phe
            325             330             335

Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu Glu Ala Pro Leu Lys
            340             345             350

Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp Glu Lys Gly
        355             360             365

Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala Ile Pro Met Ser Ile
    370             375             380

Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val Phe Leu Met Ile Glu
385             390             395             400

Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys Val Val Asn Pro Thr
            405             410             415

Gln Lys

<210>   23
<211>   2004
<212>   DNA
<213>   Homo sapiens

<400>   23
gctaacctag tgcctatagc taaggcaggt acctgcatcc ttgttttttgt ttagtggatc      60

17

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ctctatcctt cagagactct ggaacccctg tggtcttctc ttcatctaat gaccctgagg    120

ggatggagtt ttcaagtcct tccagagagg aatgtcccaa gcctttgagt agggtaagca    180

tcatggctgg cagcctcaca ggtttgcttc tacttcaggc agtgtcgtgg gcatcaggtg    240

cccgcccctg catccctaaa agcttcggct acagctcggt ggtgtgtgtc tgcaatgcca    300

catactgtga ctcctttgac cccccgacct ttcctgccct tggtaccttc agccgctatg    360

agagtacacg cagtgggcga cggatggagc tgagtatggg gcccatccag gctaatcaca    420

cgggcacagg cctgctactg accctgcagc cagaacagaa gttccagaaa gtgaagggat    480

ttggaggggc catgacagat gctgctgctc tcaacatcct tgccctgtca ccccctgccc    540

aaaatttgct acttaaatcg tacttctctg aagaaggaat cggatataac atcatccggg    600

tacccatggc cagctgtgac ttctccatcc gcacctacac ctatgcagac acccctgatg    660

atttccagtt gcacaacttc agcctcccag aggaagatac caagctcaag atacccctga    720

ttcaccgagc cctgcagttg gcccagcgtc ccgtttcact ccttgccagc ccctggacat    780

cacccacttg gctcaagacc aatggagcgg tgaatgggaa ggggtcactc aagggacagc    840

ccggagacat ctaccaccag acctgggcca gatactttgt gaagttcctg gatgcctatg    900

ctgagcacaa gttacagttc tgggcagtga cagctgaaaa tgagccttct gctgggctgt    960

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ctgtctgtga ctaaagaggg cacagcaggg ccagtgtgag cttacagcga cgtaagccca    1860

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18

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<212>    PRT
<213>    Homo sapiens

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            20                  25                  30

Ala Val Ser Trp Ala Ser Gly Ala Arg Pro Cys Ile Pro Lys Ser Phe
        35                  40                  45

Gly Tyr Ser Ser Val Val Cys Val Cys Asn Ala Thr Tyr Cys Asp Ser
    50                  55                  60

Phe Asp Pro Pro Thr Phe Pro Ala Leu Gly Thr Phe Ser Arg Tyr Glu
65                  70                  75                  80

Ser Thr Arg Ser Gly Arg Arg Met Glu Leu Ser Met Gly Pro Ile Gln
                85                  90                  95

Ala Asn His Thr Gly Thr Gly Leu Leu Leu Thr Leu Gln Pro Glu Gln
            100                 105                 110

Lys Phe Gln Lys Val Lys Gly Phe Gly Gly Ala Met Thr Asp Ala Ala
        115                 120                 125

Ala Leu Asn Ile Leu Ala Leu Ser Pro Pro Ala Gln Asn Leu Leu Leu
    130                 135                 140

Lys Ser Tyr Phe Ser Glu Glu Gly Ile Gly Tyr Asn Ile Ile Arg Val
145                 150                 155                 160

Pro Met Ala Ser Cys Asp Phe Ser Ile Arg Thr Tyr Thr Tyr Ala Asp
                165                 170                 175

Thr Pro Asp Asp Phe Gln Leu His Asn Phe Ser Leu Pro Glu Glu Asp
            180                 185                 190

Thr Lys Leu Lys Ile Pro Leu Ile His Arg Ala Leu Gln Leu Ala Gln
        195                 200                 205

Arg Pro Val Ser Leu Leu Ala Ser Pro Trp Thr Ser Pro Thr Trp Leu
    210                 215                 220

Lys Thr Asn Gly Ala Val Asn Gly Lys Gly Ser Leu Lys Gly Gln Pro
225                 230                 235                 240

Gly Asp Ile Tyr His Gln Thr Trp Ala Arg Tyr Phe Val Lys Phe Leu
                245                 250                 255

Asp Ala Tyr Ala Glu His Lys Leu Gln Phe Trp Ala Val Thr Ala Glu
            260                 265                 270

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Asn Glu Pro Ser Ala Gly Leu Leu Ser Gly Tyr Pro Phe Gln Cys Leu
    275             280             285

Gly Phe Thr Pro Glu His Gln Arg Asp Phe Ile Ala Arg Asp Leu Gly
    290             295             300

Pro Thr Leu Ala Asn Ser Thr His His Asn Val Arg Leu Leu Met Leu
305             310             315             320

Asp Asp Gln Arg Leu Leu Leu Pro His Trp Ala Lys Val Val Leu Thr
            325             330             335

Asp Pro Glu Ala Ala Lys Tyr Val His Gly Ile Ala Val His Trp Tyr
            340             345             350

Leu Asp Phe Leu Ala Pro Ala Lys Ala Thr Leu Gly Glu Thr His Arg
        355             360             365

Leu Phe Pro Asn Thr Met Leu Phe Ala Ser Glu Ala Cys Val Gly Ser
    370             375             380

Lys Phe Trp Glu Gln Ser Val Arg Leu Gly Ser Trp Asp Arg Gly Met
385             390             395             400

Gln Tyr Ser His Ser Ile Ile Thr Asn Leu Leu Tyr His Val Val Gly
            405             410             415

Trp Thr Asp Trp Asn Leu Ala Leu Asn Pro Glu Gly Gly Pro Asn Trp
            420             425             430

Val Arg Asn Phe Val Asp Ser Pro Ile Ile Val Asp Ile Thr Lys Asp
    435             440             445

Thr Phe Tyr Lys Gln Pro Met Phe Tyr His Leu Gly His Phe Ser Lys
    450             455             460

Phe Ile Pro Glu Gly Ser Gln Arg Val Gly Leu Val Ala Ser Gln Lys
465             470             475             480

Asn Asp Leu Asp Ala Val Ala Leu Met His Pro Asp Gly Ser Ala Val
            485             490             495

Val Val Val Leu Asn Arg Ser Ser Lys Asp Val Pro Leu Thr Ile Lys
        500             505             510

Asp Pro Ala Val Gly Phe Leu Glu Thr Ile Ser Pro Gly Tyr Ser Ile
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His Thr Tyr Leu Trp His Arg Gln
    530             535

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<213>   Homo sapiens

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gagttctgca gcacccctgc ctgctctgag ggaaacagtg actgctactt tgggaatggg    660

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gatgtcccgg gtgtgtacac caaggttacc aactacctag actggattcg tgacaacatg    1680

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<210>  26
<211>  562
<212>  PRT
<213>  Homo sapiens

<400>  26
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Ala Val Phe Val Ser Pro Ser Gln Glu Ile His Ala Arg Phe Arg Arg
            20              25              30

Gly Ala Arg Ser Tyr Gln Val Ile Cys Arg Asp Glu Lys Thr Gln Met
        35              40              45

Ile Tyr Gln Gln His Gln Ser Trp Leu Arg Pro Val Leu Arg Ser Asn
    50              55              60

Arg Val Glu Tyr Cys Trp Cys Asn Ser Gly Arg Ala Gln Cys His Ser
65              70              75              80

Val Pro Val Lys Ser Cys Ser Glu Pro Arg Cys Phe Asn Gly Gly Thr
            85              90              95

Cys Gln Gln Ala Leu Tyr Phe Ser Asp Phe Val Cys Gln Cys Pro Glu
        100             105             110

Gly Phe Ala Gly Lys Cys Cys Glu Ile Asp Thr Arg Ala Thr Cys Tyr
        115             120             125

Glu Asp Gln Gly Ile Ser Tyr Arg Gly Thr Trp Ser Thr Ala Glu Ser
    130             135             140

Gly Ala Glu Cys Thr Asn Trp Asn Ser Ser Ala Leu Ala Gln Lys Pro
145             150             155             160

Tyr Ser Gly Arg Arg Pro Asp Ala Ile Arg Leu Gly Leu Gly Asn His
            165             170             175

Asn Tyr Cys Arg Asn Pro Asp Arg Asp Ser Lys Pro Trp Cys Tyr Val
            180             185             190

Phe Lys Ala Gly Lys Tyr Ser Ser Glu Phe Cys Ser Thr Pro Ala Cys
        195             200             205

Ser Glu Gly Asn Ser Asp Cys Tyr Phe Gly Asn Gly Ser Ala Tyr Arg
    210             215             220

Gly Thr His Ser Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp Asn
225             230             235             240

Ser Met Ile Leu Ile Gly Lys Val Tyr Thr Ala Gln Asn Pro Ser Ala
            245             250             255

Gln Ala Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly
        260             265             270

Asp Ala Lys Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp
        275             280             285

Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr
    290             295             300

Ser Gln Pro Gln Phe Arg Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala
305             310             315             320

Ser His Pro Trp Gln Ala Ala Ile Phe Ala Lys His Arg Arg Ser Pro
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                  325                    330                    335
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Gly Glu Arg Phe Leu Cys Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile
              340                    345                    350

Leu Ser Ala Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu
          355                    360                    365

Thr Val Ile Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu
      370                    375                    380

Gln Lys Phe Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp
385                    390                    395                    400

Asp Thr Tyr Asp Asn Asp Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser
              405                    410                    415

Ser Arg Cys Ala Gln Glu Ser Ser Val Val Arg Thr Val Cys Leu Pro
          420                    425                    430

Pro Ala Asp Leu Gln Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly
          435                    440                    445

Tyr Gly Lys His Glu Ala Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys
      450                    455                    460

Glu Ala His Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln His
465                    470                    475                    480

Leu Leu Asn Arg Thr Val Thr Asp Asn Met Leu Cys Ala Gly Asp Thr
              485                    490                    495

Arg Ser Gly Gly Pro Gln Ala Asn Leu His Asp Ala Cys Gln Gly Asp
              500                    505                    510

Ser Gly Gly Pro Leu Val Cys Leu Asn Asp Gly Arg Met Thr Leu Val
          515                    520                    525

Gly Ile Ile Ser Trp Gly Leu Gly Cys Gly Gln Lys Asp Val Pro Gly
      530                    535                    540

Val Tyr Thr Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn Met
545                    550                    555                    560

Arg Pro

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<213>    Homo sapiens

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gttcgacaaa gaaaacaaag aaaacacagc tacaactgga gcatttactg ctggatttac     180

agatgatttt gaatggaatt aataattaca agaatcccaa actcaccagg atgctcacat     240

ttaagtttta catgcccaag aaggccacag aactgaaaca gcttcagtgt ctagaagaag     300

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aactcaaacc tctggaggaa gtgctgaatt tagctcaaag caaaaacttt cacttaagac    360

ccagggactt aatcagcaat atcaacgtaa tagttctgga actaaaggga tctgaaacaa    420

cattcatgtg tgaatatgca gatgagacag caaccattgt agaatttctg aacagatgga    480

ttaccttttg tcaaagcatc atctcaacac taacttgata attaagtgct tcccacttaa    540

aacatatcag gccttctatt tatttattta aatatttaaa ttttatattt attgttgaat    600

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<210>    28
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<212>    PRT
<213>    Homo sapiens

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Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ile Leu Ala Leu
1               5                   10                  15

Val Thr Asn Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Lys Lys
            20                  25                  30

Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu
        35                  40                  45

Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr
    50                  55                  60

Phe Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys Gln Leu Gln
65                  70                  75                  80

Cys Leu Glu Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala
                85                  90                  95

Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile
            100                 105                 110

Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys
        115                 120                 125

Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp
    130                 135                 140

Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
145                 150                 155

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<212>    DNA
<213>    Homo sapiens

<400>    29
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26

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tatataagag cagaagttga agataatatc atggtaactt tcagaaatca ggcctctcgt   5400

ccctattcct tctattctag ccttatttct tatgaggaag atcagaggca aggagcagaa   5460

cctagaaaaa actttgtcaa gcctaatgaa accaaaactt acttttggaa agtgcaacat   5520
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27

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catatggcac ccactaaaga tgagtttgac tgcaaagcct gggcttattt ctctgatgtt   5580

gacctggaaa aagatgtgca ctcaggcctg attggacccc ttctggtctg ccacactaac   5640

acactgaacc ctgctcatgg gagacaagtg acagtacagg aatttgctct gtttttcacc   5700

atctttgatg agaccaaaag ctggtacttc actgaaaata tggaaagaaa ctgcagggct   5760

ccctgcaata tccagatgga agatcccact tttaaagaga attatcgctt ccatgcaatc   5820

aatggctaca taatggatac actacctggc ttagtaatgg ctcaggatca aaggattcga   5880

tggtatctgc tcagcatggg cagcaatgaa aacatccatt ctattcattt cagtggacat   5940

gtgttcactg tacgaaaaaa agaggagtat aaaatggcac tgtacaatct ctatccaggt   6000

gttttttgaga cagtggaaat gttaccatcc aaagctggaa tttggcgggt ggaatgcctt   6060

attggcgagc atctacatgc tgggatgagc acactttttc tggtgtacag caataagtgt   6120

cagactcccc tgggaatggc ttctggacac attagagatt ttcagattac agcttcagga   6180

caatatggac agtgggcccc aaagctggcc agacttcatt attccggatc aatcaatgcc   6240

tggagcacca aggagccctt ttcttggatc aaggtggatc tgttggcacc aatgattatt   6300

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atcatcatgt atagtcttga tgggaagaag tggcagactt atcgaggaaa ttccactgga   6420

accttaatgg tcttctttgg caatgtggat tcatctggga taaaacacaa tattttttaac   6480

cctccaatta ttgctcgata catccgtttg cacccaactc attatagcat tcgcagcact   6540

cttcgcatgg agttgatggg ctgtgattta aatagttgca gcatgccatt gggaatggag   6600

agtaaagcaa tatcagatgc acagattact gcttcatcct actttaccaa tatgtttgcc   6660

acctggtctc cttcaaaagc tcgacttcac ctccaaggga ggagtaatgc ctggagacct   6720

caggtgaata tccaaaaga gtggctgcaa gtggacttcc agaagacaat gaaagtcaca   6780

ggagtaacta ctcagggagt aaaatctctg cttaccagca tgtatgtgaa ggagttcctc   6840

atctccagca gtcaagatgg ccatcagtgg actctctttt ttcagaatgg caaagtaaag   6900

gttttcagg gaaatcaaga ctccttcaca cctgtggtga actctctaga cccaccgtta   6960

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gaggttctgg ctgcgaggc acaggacctc tactgagggt ggccactgca gcacctgcca   7080

ctgccgtcac ctctccctcc tcagctccag ggcagtgtcc ctccctggct tgccttctac   7140

ctttgtgcta aatcctagca gacactgcct tgaagcctcc tgaattaact atcatcagtc   7200

ctgcatttct ttggtggggg gccaggaggg tgcatccaat ttaacttaac tcttacctat   7260

tttctgcagc tgctcccaga ttactccttc cttccaatat aactaggcaa aaagaagtga   7320
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ggagaaacct gcatgaaagc attcttccct gaaaagttag gcctctcaga gtcaccactt  7380

cctctgttgt agaaaaacta tgtgatgaaa ctttgaaaaa gatatttatg atgttaacat  7440

ttcaggttaa gcctcatacg tttaaaataa aactctcagt tgtttattat cctgatcaag  7500

catggaacaa agcatgtttc aggatcagat caatacaatc ttggagtcaa aaggcaaatc  7560

atttggacaa tctgcaaaat ggagagaata caataactac tacagtaaag tctgtttctg  7620

cttccttaca catagatata attatgttat ttagtcatta tgaggggcac attcttatct  7680

ccaaaactag cattcttaaa ctgagaatta tagatggggt tcaagaatcc ctaagtcccc  7740

tgaaattata taaggcattc tgtataaatg caaatgtgca tttttctgac gagtgtccat  7800

agatataaag ccatttggtc ttaattctga ccaataaaaa aataagtcag gaggatgcaa  7860

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<210>  30
<211>  2351
<212>  PRT
<213>  Homo sapiens
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Cys Phe Ser Ala Thr Arg Arg Tyr Tyr Leu Gly Ala Val Glu Leu Ser
            20                  25                  30

Trp Asp Tyr Met Gln Ser Asp Leu Gly Glu Leu Pro Val Asp Ala Arg
        35                  40                  45

Phe Pro Pro Arg Val Pro Lys Ser Phe Pro Phe Asn Thr Ser Val Val
    50                  55                  60

Tyr Lys Lys Thr Leu Phe Val Glu Phe Thr Asp His Leu Phe Asn Ile
65                  70                  75                  80

Ala Lys Pro Arg Pro Pro Trp Met Gly Leu Leu Gly Pro Thr Ile Gln
                85                  90                  95

Ala Glu Val Tyr Asp Thr Val Val Ile Thr Leu Lys Asn Met Ala Ser
            100                 105                 110

His Pro Val Ser Leu His Ala Val Gly Val Ser Tyr Trp Lys Ala Ser
        115                 120                 125

Glu Gly Ala Glu Tyr Asp Asp Gln Thr Ser Gln Arg Glu Lys Glu Asp
    130                 135                 140

Asp Lys Val Phe Pro Gly Gly Ser His Thr Tyr Val Trp Gln Val Leu
145                 150                 155                 160

Lys Glu Asn Gly Pro Met Ala Ser Asp Pro Leu Cys Leu Thr Tyr Ser
                165                 170                 175
```

```
Tyr Leu Ser His Val Asp Leu Val Lys Asp Leu Asn Ser Gly Leu Ile
            180                 185                 190

Gly Ala Leu Leu Val Cys Arg Glu Gly Ser Leu Ala Lys Glu Lys Thr
        195                 200                 205

Gln Thr Leu His Lys Phe Ile Leu Leu Phe Ala Val Phe Asp Glu Gly
    210                 215                 220

Lys Ser Trp His Ser Glu Thr Lys Asn Ser Leu Met Gln Asp Arg Asp
225                 230                 235                 240

Ala Ala Ser Ala Arg Ala Trp Pro Lys Met His Thr Val Asn Gly Tyr
                245                 250                 255

Val Asn Arg Ser Leu Pro Gly Leu Ile Gly Cys His Arg Lys Ser Val
            260                 265                 270

Tyr Trp His Val Ile Gly Met Gly Thr Thr Pro Glu Val His Ser Ile
        275                 280                 285

Phe Leu Glu Gly His Thr Phe Leu Val Arg Asn His Arg Gln Ala Ser
    290                 295                 300

Leu Glu Ile Ser Pro Ile Thr Phe Leu Thr Ala Gln Thr Leu Leu Met
305                 310                 315                 320

Asp Leu Gly Gln Phe Leu Leu Phe Cys His Ile Ser Ser His Gln His
                325                 330                 335

Asp Gly Met Glu Ala Tyr Val Lys Val Asp Ser Cys Pro Glu Glu Pro
            340                 345                 350

Gln Leu Arg Met Lys Asn Asn Glu Glu Ala Glu Asp Tyr Asp Asp Asp
        355                 360                 365

Leu Thr Asp Ser Glu Met Asp Val Val Arg Phe Asp Asp Asp Asn Ser
    370                 375                 380

Pro Ser Phe Ile Gln Ile Arg Ser Val Ala Lys Lys His Pro Lys Thr
385                 390                 395                 400

Trp Val His Tyr Ile Ala Ala Glu Glu Glu Asp Trp Asp Tyr Ala Pro
            405                 410                 415

Leu Val Leu Ala Pro Asp Asp Arg Ser Tyr Lys Ser Gln Tyr Leu Asn
        420                 425                 430

Asn Gly Pro Gln Arg Ile Gly Arg Lys Tyr Lys Lys Val Arg Phe Met
        435                 440                 445

Ala Tyr Thr Asp Glu Thr Phe Lys Thr Arg Glu Ala Ile Gln His Glu
    450                 455                 460

Ser Gly Ile Leu Gly Pro Leu Leu Tyr Gly Glu Val Gly Asp Thr Leu
465                 470                 475                 480

Leu Ile Ile Phe Lys Asn Gln Ala Ser Arg Pro Tyr Asn Ile Tyr Pro
                485                 490                 495

His Gly Ile Thr Asp Val Arg Pro Leu Tyr Ser Arg Arg Leu Pro Lys
```

```
                500                      505                      510

Gly Val Lys His Leu Lys Asp Phe Pro Ile Leu Pro Gly Glu Ile Phe
        515                 520                 525

Lys Tyr Lys Trp Thr Val Thr Val Glu Asp Gly Pro Thr Lys Ser Asp
        530                 535                 540

Pro Arg Cys Leu Thr Arg Tyr Tyr Ser Ser Phe Val Asn Met Glu Arg
545                 550                 555                 560

Asp Leu Ala Ser Gly Leu Ile Gly Pro Leu Leu Ile Cys Tyr Lys Glu
                565                 570                 575

Ser Val Asp Gln Arg Gly Asn Gln Ile Met Ser Asp Lys Arg Asn Val
            580                 585                 590

Ile Leu Phe Ser Val Phe Asp Glu Asn Arg Ser Trp Tyr Leu Thr Glu
        595                 600                 605

Asn Ile Gln Arg Phe Leu Pro Asn Pro Ala Gly Val Gln Leu Glu Asp
        610                 615                 620

Pro Glu Phe Gln Ala Ser Asn Ile Met His Ser Ile Asn Gly Tyr Val
625                 630                 635                 640

Phe Asp Ser Leu Gln Leu Ser Val Cys Leu His Glu Val Ala Tyr Trp
                645                 650                 655

Tyr Ile Leu Ser Ile Gly Ala Gln Thr Asp Phe Leu Ser Val Phe Phe
                660                 665                 670

Ser Gly Tyr Thr Phe Lys His Lys Met Val Tyr Glu Asp Thr Leu Thr
        675                 680                 685

Leu Phe Pro Phe Ser Gly Glu Thr Val Phe Met Ser Met Glu Asn Pro
        690                 695                 700

Gly Leu Trp Ile Leu Gly Cys His Asn Ser Asp Phe Arg Asn Arg Gly
705                 710                 715                 720

Met Thr Ala Leu Leu Lys Val Ser Ser Cys Asp Lys Asn Thr Gly Asp
                725                 730                 735

Tyr Tyr Glu Asp Ser Tyr Glu Asp Ile Ser Ala Tyr Leu Leu Ser Lys
            740                 745                 750

Asn Asn Ala Ile Glu Pro Arg Ser Phe Ser Gln Asn Ser Arg His Arg
        755                 760                 765

Ser Thr Arg Gln Lys Gln Phe Asn Ala Thr Thr Ile Pro Glu Asn Asp
        770                 775                 780

Ile Glu Lys Thr Asp Pro Trp Phe Ala His Arg Thr Pro Met Pro Lys
785                 790                 795                 800

Ile Gln Asn Val Ser Ser Ser Asp Leu Leu Met Leu Leu Arg Gln Ser
                805                 810                 815

Pro Thr Pro His Gly Leu Ser Leu Ser Asp Leu Gln Glu Ala Lys Tyr
            820                 825                 830
```

```
Glu Thr Phe Ser Asp Asp Pro Ser Pro Gly Ala Ile Asp Ser Asn Asn
        835             840             845

Ser Leu Ser Glu Met Thr His Phe Arg Pro Gln Leu His His Ser Gly
        850             855             860

Asp Met Val Phe Thr Pro Glu Ser Gly Leu Gln Leu Arg Leu Asn Glu
865             870             875             880

Lys Leu Gly Thr Thr Ala Ala Thr Glu Leu Lys Lys Leu Asp Phe Lys
            885             890             895

Val Ser Ser Thr Ser Asn Asn Leu Ile Ser Thr Ile Pro Ser Asp Asn
            900             905             910

Leu Ala Ala Gly Thr Asp Asn Thr Ser Ser Leu Gly Pro Pro Ser Met
        915             920             925

Pro Val His Tyr Asp Ser Gln Leu Asp Thr Thr Leu Phe Gly Lys Lys
        930             935             940

Ser Ser Pro Leu Thr Glu Ser Gly Gly Pro Leu Ser Leu Ser Glu Glu
945             950             955             960

Asn Asn Asp Ser Lys Leu Leu Glu Ser Gly Leu Met Asn Ser Gln Glu
            965             970             975

Ser Ser Trp Gly Lys Asn Val Ser Ser Thr Glu Ser Gly Arg Leu Phe
            980             985             990

Lys Gly Lys Arg Ala His Gly Pro  Ala Leu Leu Thr Lys  Asp Asn Ala
        995             1000            1005

Leu Phe  Lys Val Ser Ile Ser  Leu Leu Lys Thr Asn  Lys Thr Ser
    1010            1015            1020

Asn Asn  Ser Ala Thr Asn Arg  Lys Thr His Ile Asp  Gly Pro Ser
    1025            1030            1035

Leu Leu  Ile Glu Asn Ser Pro  Ser Val Trp Gln Asn  Ile Leu Glu
    1040            1045            1050

Ser Asp  Thr Glu Phe Lys Lys  Val Thr Pro Leu Ile  His Asp Arg
    1055            1060            1065

Met Leu  Met Asp Lys Asn Ala  Thr Ala Leu Arg Leu  Asn His Met
    1070            1075            1080

Ser Asn  Lys Thr Thr Ser Ser  Lys Asn Met Glu Met  Val Gln Gln
    1085            1090            1095

Lys Lys  Glu Gly Pro Ile Pro  Pro Asp Ala Gln Asn  Pro Asp Met
    1100            1105            1110

Ser Phe  Phe Lys Met Leu Phe  Leu Pro Glu Ser Ala  Arg Trp Ile
    1115            1120            1125

Gln Arg  Thr His Gly Lys Asn  Ser Leu Asn Ser Gly  Gln Gly Pro
    1130            1135            1140
```

32

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Ser Pro  Lys Gln Leu Val Ser  Leu Gly Pro Glu Lys  Ser Val Glu
    1145                 1150              1155

Gly Gln  Asn Phe Leu Ser Glu  Lys Asn Lys Val Val  Val Gly Lys
    1160                 1165              1170

Gly Glu  Phe Thr Lys Asp Val  Gly Leu Lys Glu Met  Val Phe Pro
    1175                 1180              1185

Ser Ser  Arg Asn Leu Phe Leu  Thr Asn Leu Asp Asn  Leu His Glu
    1190                 1195              1200

Asn Asn  Thr His Asn Gln Glu  Lys Lys Ile Gln Glu  Glu Ile Glu
    1205                 1210              1215

Lys Lys  Glu Thr Leu Ile Gln  Glu Asn Val Val Leu  Pro Gln Ile
    1220                 1225              1230

His Thr  Val Thr Gly Thr Lys  Asn Phe Met Lys Asn  Leu Phe Leu
    1235                 1240              1245

Leu Ser  Thr Arg Gln Asn Val  Glu Gly Ser Tyr Asp  Gly Ala Tyr
    1250                 1255              1260

Ala Pro  Val Leu Gln Asp Phe  Arg Ser Leu Asn Asp  Ser Thr Asn
    1265                 1270              1275

Arg Thr  Lys Lys His Thr Ala  His Phe Ser Lys Lys  Gly Glu Glu
    1280                 1285              1290

Glu Asn  Leu Glu Gly Leu Gly  Asn Gln Thr Lys Gln  Ile Val Glu
    1295                 1300              1305

Lys Tyr  Ala Cys Thr Thr Arg  Ile Ser Pro Asn Thr  Ser Gln Gln
    1310                 1315              1320

Asn Phe  Val Thr Gln Arg Ser  Lys Arg Ala Leu Lys  Gln Phe Arg
    1325                 1330              1335

Leu Pro  Leu Glu Glu Thr Glu  Leu Glu Lys Arg Ile  Ile Val Asp
    1340                 1345              1350

Asp Thr  Ser Thr Gln Trp Ser  Lys Asn Met Lys His  Leu Thr Pro
    1355                 1360              1365

Ser Thr  Leu Thr Gln Ile Asp  Tyr Asn Glu Lys Glu  Lys Gly Ala
    1370                 1375              1380

Ile Thr  Gln Ser Pro Leu Ser  Asp Cys Leu Thr Arg  Ser His Ser
    1385                 1390              1395

Ile Pro  Gln Ala Asn Arg Ser  Pro Leu Pro Ile Ala  Lys Val Ser
    1400                 1405              1410

Ser Phe  Pro Ser Ile Arg Pro  Ile Tyr Leu Thr Arg  Val Leu Phe
    1415                 1420              1425

Gln Asp  Asn Ser Ser His Leu  Pro Ala Ala Ser Tyr  Arg Lys Lys
    1430                 1435              1440

Asp Ser  Gly Val Gln Glu Ser  Ser His Phe Leu Gln  Gly Ala Lys
```

```
    1445                    1450                    1455

Lys Asn  Asn Leu Ser Leu Ala  Ile Leu Thr Leu Glu  Met Thr Gly
    1460                    1465                    1470

Asp Gln  Arg Glu Val Gly Ser  Leu Gly Thr Ser Ala  Thr Asn Ser
    1475                    1480                    1485

Val Thr  Tyr Lys Lys Val Glu  Asn Thr Val Leu Pro  Lys Pro Asp
    1490                    1495                    1500

Leu Pro  Lys Thr Ser Gly Lys  Val Glu Leu Leu Pro  Lys Val His
    1505                    1510                    1515

Ile Tyr  Gln Lys Asp Leu Phe  Pro Thr Glu Thr Ser  Asn Gly Ser
    1520                    1525                    1530

Pro Gly  His Leu Asp Leu Val  Glu Gly Ser Leu Leu  Gln Gly Thr
    1535                    1540                    1545

Glu Gly  Ala Ile Lys Trp Asn  Glu Ala Asn Arg Pro  Gly Lys Val
    1550                    1555                    1560

Pro Phe  Leu Arg Val Ala Thr  Glu Ser Ser Ala Lys  Thr Pro Ser
    1565                    1570                    1575

Lys Leu  Leu Asp Pro Leu Ala  Trp Asp Asn His Tyr  Gly Thr Gln
    1580                    1585                    1590

Ile Pro  Lys Glu Glu Trp Lys  Ser Gln Glu Lys Ser  Pro Glu Lys
    1595                    1600                    1605

Thr Ala  Phe Lys Lys Lys Asp  Thr Ile Leu Ser Leu  Asn Ala Cys
    1610                    1615                    1620

Glu Ser  Asn His Ala Ile Ala  Ala Ile Asn Glu Gly  Gln Asn Lys
    1625                    1630                    1635

Pro Glu  Ile Glu Val Thr Trp  Ala Lys Gln Gly Arg  Thr Glu Arg
    1640                    1645                    1650

Leu Cys  Ser Gln Asn Pro Pro  Val Leu Lys Arg His  Gln Arg Glu
    1655                    1660                    1665

Ile Thr  Arg Thr Thr Leu Gln  Ser Asp Gln Glu Glu  Ile Asp Tyr
    1670                    1675                    1680

Asp Asp  Thr Ile Ser Val Glu  Met Lys Lys Glu Asp  Phe Asp Ile
    1685                    1690                    1695

Tyr Asp  Glu Asp Glu Asn Gln  Ser Pro Arg Ser Phe  Gln Lys Lys
    1700                    1705                    1710

Thr Arg  His Tyr Phe Ile Ala  Ala Val Glu Arg Leu  Trp Asp Tyr
    1715                    1720                    1725

Gly Met  Ser Ser Ser Pro His  Val Leu Arg Asn Arg  Ala Gln Ser
    1730                    1735                    1740

Gly Ser  Val Pro Gln Phe Lys  Lys Val Val Phe Gln  Glu Phe Thr
    1745                    1750                    1755
```

```
Asp Gly  Ser Phe Thr Gln Pro  Leu Tyr Arg Gly Glu  Leu Asn Glu
    1760             1765             1770

His Leu  Gly Leu Leu Gly Pro  Tyr Ile Arg Ala Glu  Val Glu Asp
    1775             1780             1785

Asn Ile  Met Val Thr Phe Arg  Asn Gln Ala Ser Arg  Pro Tyr Ser
    1790             1795             1800

Phe Tyr  Ser Ser Leu Ile Ser  Tyr Glu Glu Asp Gln  Arg Gln Gly
    1805             1810             1815

Ala Glu  Pro Arg Lys Asn Phe  Val Lys Pro Asn Glu  Thr Lys Thr
    1820             1825             1830

Tyr Phe  Trp Lys Val Gln His  His Met Ala Pro Thr  Lys Asp Glu
    1835             1840             1845

Phe Asp  Cys Lys Ala Trp Ala  Tyr Phe Ser Asp Val  Asp Leu Glu
    1850             1855             1860

Lys Asp  Val His Ser Gly Leu  Ile Gly Pro Leu Leu  Val Cys His
    1865             1870             1875

Thr Asn  Thr Leu Asn Pro Ala  His Gly Arg Gln Val  Thr Val Gln
    1880             1885             1890

Glu Phe  Ala Leu Phe Phe Thr  Ile Phe Asp Glu Thr  Lys Ser Trp
    1895             1900             1905

Tyr Phe  Thr Glu Asn Met Glu  Arg Asn Cys Arg Ala  Pro Cys Asn
    1910             1915             1920

Ile Gln  Met Glu Asp Pro Thr  Phe Lys Glu Asn Tyr  Arg Phe His
    1925             1930             1935

Ala Ile  Asn Gly Tyr Ile Met  Asp Thr Leu Pro Gly  Leu Val Met
    1940             1945             1950

Ala Gln  Asp Gln Arg Ile Arg  Trp Tyr Leu Leu Ser  Met Gly Ser
    1955             1960             1965

Asn Glu  Asn Ile His Ser Ile  His Phe Ser Gly His  Val Phe Thr
    1970             1975             1980

Val Arg  Lys Lys Glu Glu Tyr  Lys Met Ala Leu Tyr  Asn Leu Tyr
    1985             1990             1995

Pro Gly  Val Phe Glu Thr Val  Glu Met Leu Pro Ser  Lys Ala Gly
    2000             2005             2010

Ile Trp  Arg Val Glu Cys Leu  Ile Gly Glu His Leu  His Ala Gly
    2015             2020             2025

Met Ser  Thr Leu Phe Leu Val  Tyr Ser Asn Lys Cys  Gln Thr Pro
    2030             2035             2040

Leu Gly  Met Ala Ser Gly His  Ile Arg Asp Phe Gln  Ile Thr Ala
    2045             2050             2055
```

35

```
Ser Gly  Gln Tyr Gly Gln Trp  Ala Pro Lys Leu Ala  Arg Leu His
    2060              2065              2070

Tyr Ser  Gly Ser Ile Asn Ala  Trp Ser Thr Lys Glu  Pro Phe Ser
    2075              2080              2085

Trp Ile  Lys Val Asp Leu Leu  Ala Pro Met Ile Ile  His Gly Ile
    2090              2095              2100

Lys Thr  Gln Gly Ala Arg Gln  Lys Phe Ser Ser Leu  Tyr Ile Ser
    2105              2110              2115

Gln Phe  Ile Ile Met Tyr Ser  Leu Asp Gly Lys Lys  Trp Gln Thr
    2120              2125              2130

Tyr Arg  Gly Asn Ser Thr Gly  Thr Leu Met Val Phe  Phe Gly Asn
    2135              2140              2145

Val Asp  Ser Ser Gly Ile Lys  His Asn Ile Phe Asn  Pro Pro Ile
    2150              2155              2160

Ile Ala  Arg Tyr Ile Arg Leu  His Pro Thr His Tyr  Ser Ile Arg
    2165              2170              2175

Ser Thr  Leu Arg Met Glu Leu  Met Gly Cys Asp Leu  Asn Ser Cys
    2180              2185              2190

Ser Met  Pro Leu Gly Met Glu  Ser Lys Ala Ile Ser  Asp Ala Gln
    2195              2200              2205

Ile Thr  Ala Ser Ser Tyr Phe  Thr Asn Met Phe Ala  Thr Trp Ser
    2210              2215              2220

Pro Ser  Lys Ala Arg Leu His  Leu Gln Gly Arg Ser  Asn Ala Trp
    2225              2230              2235

Arg Pro  Gln Val Asn Asn Pro  Lys Glu Trp Leu Gln  Val Asp Phe
    2240              2245              2250

Gln Lys  Thr Met Lys Val Thr  Gly Val Thr Thr Gln  Gly Val Lys
    2255              2260              2265

Ser Leu  Leu Thr Ser Met Tyr  Val Lys Glu Phe Leu  Ile Ser Ser
    2270              2275              2280

Ser Gln  Asp Gly His Gln Trp  Thr Leu Phe Phe Gln  Asn Gly Lys
    2285              2290              2295

Val Lys  Val Phe Gln Gly Asn  Gln Asp Ser Phe Thr  Pro Val Val
    2300              2305              2310

Asn Ser  Leu Asp Pro Pro Leu  Leu Thr Arg Tyr Leu  Arg Ile His
    2315              2320              2325

Pro Gln  Ser Trp Val His Gln  Ile Ala Leu Arg Met  Glu Val Leu
    2330              2335              2340

Gly Cys  Glu Ala Gln Asp Leu  Tyr
    2345              2350
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<210> 31

<211> 1471
<212> DNA
<213> Homo sapiens

<400> 31

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cacgccttgc ccgcccaggt ggcatttaca ccctacgccc cggagcccgg gagcacatgc   120

cggctcagag aatactatga ccagacagct cagatgtgct gcagcaaatg ctcgccgggc   180

caacatgcaa aagtcttctg taccaagacc tcggacaccg tgtgtgactc ctgtgaggac   240

agcacataca cccagctctg gaactgggtt cccgagtgct tgagctgtgg ctcccgctgt   300

agctctgacc aggtggaaac tcaagcctgc actcgggaac agaaccgcat ctgcacctgc   360

aggcccggct ggtactgcgc gctgagcaag caggaggggt gccggctgtg cgcgccgctg   420

cgcaagtgcc gcccgggctt cggcgtggcc agaccaggaa ctgaaacatc agacgtggtg   480

tgcaagccct gtgccccggg gacgttctcc aacacgactt catccacgga tatttgcagg   540

ccccaccaga tctgtaacgt ggtggccatc cctgggaatg caagcatgga tgcagtctgc   600

acgtccacgt ccccccacccg gagtatggcc caggggcag tacacttacc ccagccagtg   660

tccacacgat cccaacacac gcagccaact ccagaaccca gcactgctcc aagcacctcc   720

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ccagttggac tgattgtggg tgtgacagcc ttgggtctac taataatagg agtggtgaac   840

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gtcccccttct ccaaggagga atgtgccttt cggtcacagc tggagacgcc agagaccctg  1320

ctggggagca ccgaagagaa gcccctgccc cttggagtgc ctgatgctgg gatgaagccc  1380

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<210> 32
<211> 461
<212> PRT
<213> Homo sapiens

<400> 32

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Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr
        20              25              30

Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln
    35              40              45

Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys
    50              55              60

Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp
65              70              75              80

Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys
            85              90              95

Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg
        100             105             110

Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu
        115             120             125

Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg
    130             135             140

Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val
145             150             155             160

Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr
            165             170             175

Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly
        180             185             190

Asn Ala Ser Met Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser
        195             200             205

Met Ala Pro Gly Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser
    210             215             220

Gln His Thr Gln Pro Thr Pro Glu Pro Ser Thr Ala Pro Ser Thr Ser
225             230             235             240

Phe Leu Leu Pro Met Gly Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly
            245             250             255

Asp Phe Ala Leu Pro Val Gly Leu Ile Val Gly Val Thr Ala Leu Gly
        260             265             270

Leu Leu Ile Ile Gly Val Val Asn Cys Val Ile Met Thr Gln Val Lys
        275             280             285

Lys Lys Pro Leu Cys Leu Gln Arg Glu Ala Lys Val Pro His Leu Pro
    290             295             300

Ala Asp Lys Ala Arg Gly Thr Gln Gly Pro Glu Gln Gln His Leu Leu
305             310             315             320

Ile Thr Ala Pro Ser Ser Ser Ser Ser Ser Leu Glu Ser Ser Ala Ser
```

```
              325                    330                    335
```

Ala Leu Asp Arg Arg Ala Pro Thr Arg Asn Gln Pro Gln Ala Pro Gly
            340                    345                    350

Val Glu Ala Ser Gly Ala Gly Glu Ala Arg Ala Ser Thr Gly Ser Ser
            355                    360                    365

Asp Ser Ser Pro Gly Gly His Gly Thr Gln Val Asn Val Thr Cys Ile
            370                    375                    380

Val Asn Val Cys Ser Ser Ser Asp His Ser Ser Gln Cys Ser Ser Gln
385                    390                    395                    400

Ala Ser Ser Thr Met Gly Asp Thr Asp Ser Ser Pro Ser Glu Ser Pro
                       405                    410                    415

Lys Asp Glu Gln Val Pro Phe Ser Lys Glu Glu Cys Ala Phe Arg Ser
            420                    425                    430

Gln Leu Glu Thr Pro Glu Thr Leu Leu Gly Ser Thr Glu Glu Lys Pro
            435                    440                    445

Leu Pro Leu Gly Val Pro Asp Ala Gly Met Lys Pro Ser
    450                    455                    460

```
<210>   33
<211>   1475
<212>   DNA
<213>   Homo sapiens

<400>   33
tccacctgtc cccgcagcgc cggctcgcgc cctcctgccg cagccaccga gccgccgtct    60

agcgccccga cctcgccacc atgagagccc tgctggcgcg cctgcttctc tgcgtcctgg   120

tcgtgagcga ctccaaaggc agcaatgaac ttcatcaagt tccatcgaac tgtgactgtc   180

taaatggagg aacatgtgtg tccaacaagt acttctccaa cattcactgg tgcaactgcc   240

caaagaaatt cggagggcag cactgtgaaa tagataagtc aaaaacctgc tatgagggga   300

atggtcactt ttaccgagga aaggccagca ctgacaccat gggccggccc tgcctgccct   360

ggaactctgc cactgtcctt cagcaaacgt accatgccca cagatctgat gctcttcagc   420

tgggcctggg aaacataat tactgcagga acccagacaa ccggaggcga ccctggtgct   480

atgtgcaggt gggcctaaag ccgcttgtcc aagagtgcat ggtgcatgac tgcgcagatg   540

gaaaaaagcc ctcctctcct ccagaagaat aaaaatttca gtgtggccaa aagactctga   600

ggccccgctt aagattatt gggggagaat tcaccaccat cgagaaccag ccctggtttg   660

cggccatcta caggaggcac cggggggggct ctgtcaccta cgtgtgtgga ggcagcctca   720

tcagcccttg ctgggtgatc agcgccacac actgcttcat tgattaccca agaaggagg   780

actacatcgt ctacctgggt cgctcaaggc ttaactccaa cacgcaaggg gagatgaagt   840

ttgaggtgga aaacctcatc ctacacaagg actacagcgc tgacacgctt gctcaccaca   900
```

```
                                   39
```

```
acgacattgc cttgctgaag atccgttcca aggagggcag gtgtgcgcag ccatcccgga    960

ctatacagac catctgcctg ccctcgatgt ataacgatcc ccagtttggc acaagctgtg   1020

agatcactgg ctttggaaaa gagaattcta ccgactatct ctatccggag cagctgaaga   1080

tgactgttgt gaagctgatt tcccaccggg agtgtcagca gccccactac tacggctctg   1140

aagtcaccac caaaatgctg tgtgctgctg acccacagtg gaaaacagat tcctgccagg   1200

gagactcagg gggacccctc gtctgttccc tccaaggccg catgactttg actggaattg   1260

tgagctgggg ccgtggatgt gccctgaagg acaagccagg cgtctacacg agagtctcac   1320

acttcttacc ctggatccgc agtcacacca aggaagagaa tggcctggcc ctctgagggt   1380

ccccagggag gaaacgggca ccaccgcctt tcttgctggt tgtcattttt gcagtagagt   1440

catctccatc agctgtaaga agagactggg aagat                             1475
```

```
<210>   34
<211>   431
<212>   PRT
<213>   Homo sapiens

<400>   34
Met Arg Ala Leu Leu Ala Arg Leu Leu Leu Cys Val Leu Val Val Ser
1               5                   10                  15

Asp Ser Lys Gly Ser Asn Glu Leu His Gln Val Pro Ser Asn Cys Asp
            20                  25                  30

Cys Leu Asn Gly Gly Thr Cys Val Ser Asn Lys Tyr Phe Ser Asn Ile
        35                  40                  45

His Trp Cys Asn Cys Pro Lys Lys Phe Gly Gly Gln His Cys Glu Ile
    50                  55                  60

Asp Lys Ser Lys Thr Cys Tyr Glu Gly Asn Gly His Phe Tyr Arg Gly
65                  70                  75                  80

Lys Ala Ser Thr Asp Thr Met Gly Arg Pro Cys Leu Pro Trp Asn Ser
                85                  90                  95

Ala Thr Val Leu Gln Gln Thr Tyr His Ala His Arg Ser Asp Ala Leu
                100                 105                 110

Gln Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Asn Arg
            115                 120                 125

Arg Arg Pro Trp Cys Tyr Val Gln Val Gly Leu Lys Pro Leu Val Gln
    130                 135                 140

Glu Cys Met Val His Asp Cys Ala Asp Gly Lys Lys Pro Ser Ser Pro
145                 150                 155                 160

Pro Glu Glu Leu Lys Phe Gln Cys Gly Gln Lys Thr Leu Arg Pro Arg
                165                 170                 175

Phe Lys Ile Ile Gly Gly Glu Phe Thr Thr Ile Glu Asn Gln Pro Trp
```

```
                  180                    185                        190

Phe Ala Ala Ile Tyr Arg Arg His Arg Gly Gly Ser Val Thr Tyr Val
        195             200                 205

Cys Gly Gly Ser Leu Ile Ser Pro Cys Trp Val Ile Ser Ala Thr His
        210             215                 220

Cys Phe Ile Asp Tyr Pro Lys Lys Glu Asp Tyr Ile Val Tyr Leu Gly
225             230                 235                     240

Arg Ser Arg Leu Asn Ser Asn Thr Gln Gly Glu Met Lys Phe Glu Val
                245                 250                     255

Glu Asn Leu Ile Leu His Lys Asp Tyr Ser Ala Asp Thr Leu Ala His
            260                 265                 270

His Asn Asp Ile Ala Leu Leu Lys Ile Arg Ser Lys Glu Gly Arg Cys
        275                 280                 285

Ala Gln Pro Ser Arg Thr Ile Gln Thr Ile Cys Leu Pro Ser Met Tyr
    290                 295                 300

Asn Asp Pro Gln Phe Gly Thr Ser Cys Glu Ile Thr Gly Phe Gly Lys
305                 310                 315                     320

Glu Asn Ser Thr Asp Tyr Leu Tyr Pro Glu Gln Leu Lys Met Thr Val
                325                 330                 335

Val Lys Leu Ile Ser His Arg Glu Cys Gln Gln Pro His Tyr Tyr Gly
            340                 345                 350

Ser Glu Val Thr Thr Lys Met Leu Cys Ala Ala Asp Pro Gln Trp Lys
        355                 360                 365

Thr Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Val Cys Ser Leu
    370                 375                 380

Gln Gly Arg Met Thr Leu Thr Gly Ile Val Ser Trp Gly Arg Gly Cys
385                 390                 395                     400

Ala Leu Lys Asp Lys Pro Gly Val Tyr Thr Arg Val Ser His Phe Leu
                405                 410                 415

Pro Trp Ile Arg Ser His Thr Lys Glu Glu Asn Gly Leu Ala Leu
                420                 425                 430

<210>   35
<211>   107
<212>   PRT
<213>   Mus musculus

<400>   35
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Val Asn Thr Ala
                20                  25                  30

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
            35                  40                  45
```

```
Tyr Ser Ala Ser Phe Leu Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
    50              55              60

Ser Arg Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65              70              75              80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln His Tyr Thr Thr Pro Pro
            85              90              95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
        100             105
```

<210> 36
<211> 120
<212> PRT
<213> Mus musculus

<400> 36
```
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5               10              15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asn Ile Lys Asp Thr
        20              25              30

Tyr Ile His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
    35              40              45

Ala Arg Ile Tyr Pro Thr Asn Gly Tyr Thr Arg Tyr Ala Asp Ser Val
    50              55              60

Lys Gly Arg Phe Thr Ile Ser Ala Asp Thr Ser Lys Asn Thr Ala Tyr
65              70              75              80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
            85              90              95

Ser Arg Trp Gly Gly Asp Gly Phe Tyr Ala Met Asp Tyr Trp Gly Gln
        100             105             110

Gly Thr Leu Val Thr Val Ser Ser
        115             120
```

<210> 37
<211> 120
<212> PRT
<213> Mus musculus

<400> 37
```
Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1               5               10              15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser Thr Ser
            20              25              30

Gly Met Ser Val Gly Trp Ile Arg Gln Pro Ser Gly Lys Ala Leu Glu
        35              40              45

Trp Leu Ala Asp Ile Trp Trp Asp Asp Lys Lys Asp Tyr Asn Pro Ser
    50              55              60
```

Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val
65                  70                  75                  80

Val Leu Lys Val Thr Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Tyr
                85                  90                  95

Cys Ala Arg Ser Met Ile Thr Asn Trp Tyr Phe Asp Val Trp Gly Ala
            100                 105                 110

Gly Thr Thr Val Thr Val Ser Ser
        115                 120

<210>   38
<211>   106
<212>   PRT
<213>   Mus musculus

<400>   38
Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
1               5                   10                  15

Asp Arg Val Thr Ile Thr Cys Lys Cys Gln Leu Ser Val Gly Tyr Met
            20                  25                  30

His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Trp Ile Tyr
        35                  40                  45

Asp Thr Ser Lys Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
    50                  55                  60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Asp
65                  70                  75                  80

Asp Phe Ala Thr Tyr Tyr Cys Phe Gln Gly Ser Gly Tyr Pro Phe Thr
                85                  90                  95

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105

<210>   39
<211>   1039
<212>   DNA
<213>   Homo sapiens

<400>   39
tcctgcacag gcagtgcctt gaagtgcttc ttcagagacc tttcttcata gactactttt      60

ttttctttaa gcagcaaaag gagaaaattg tcatcaaagg atattccaga ttcttgacag     120

cattctcgtc atctctgagg acatcaccat catctcagga tgaggggcat gaagctgctg     180

ggggcgctgc tggcactggc ggccctactg caggggggcg tgtccctgaa gatcgcagcc     240

ttcaacatcc agacatttgg ggagaccaag atgtccaatg ccaccctcgt cagctacatt     300

gtgcagatcc tgagccgcta tgacatcgcc ctggtccagg aggtcagaga cagccacctg     360

actgccgtgg ggaagctgct ggacaacctc aatcaggatg caccagacac ctatcactac     420

gtggtcagtg agccactggg acggaacagc tataaggagc gctacctgtt cgtgtacagg     480

```
cctgaccagg tgtctgcggt ggacagctac tactacgatg atggctgcga gccctgcggg     540

aacgacacct tcaaccgaga gccagccatt gtcaggttct tctcccggtt cacagaggtc,    600

agggagtttg ccattgttcc cctgcatgcg gccccggggg acgcagtagc cgagatcgac     660

gctctctatg acgtctacct ggatgtccaa gagaaatggg gcttggagga cgtcatgttg     720

atgggcgact caatgcgggg ctgcagctat gtgagaccct cccagtggtc atccatccgc     780

ctgtggacaa gccccacctt ccagtggctg atccccgaca cgctgacac acagctaca       840

cccacgcact gtgcctatga caggatcgtg gttgcaggga tgctgctccg aggcgccgtt     900

gttcccgact cggctcttcc ctttaacttc caggctgcct atggcctgag tgaccaactg     960

gcccaagcca tcagtgacca ctatccagtg gaggtgatgc tgaagtgagc agcccctccc    1020

cacaccagtt gaactgcag                                                 1039
```

```
<210>  40
<211>  282
<212>  PRT
<213>  Homo sapiens

<400>  40
Met Arg Gly Met Lys Leu Leu Gly Ala Leu Leu Ala Leu Ala Ala Leu
1               5                   10                  15

Leu Gln Gly Ala Val Ser Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr
            20                  25                  30

Phe Gly Glu Thr Lys Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val
        35                  40                  45

Gln Ile Leu Ser Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp
    50                  55                  60

Ser His Leu Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp
65                  70                  75                  80

Ala Pro Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn
                85                  90                  95

Ser Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
            100                 105                 110

Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly Asn
        115                 120                 125

Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser Arg Phe
    130                 135                 140

Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala Ala Pro Gly
145                 150                 155                 160

Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val Tyr Leu Asp Val
                165                 170                 175

Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu Met Gly Asp Phe Asn
            180                 185                 190
```

```
        Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln Trp Ser Ser Ile Arg Leu
                195                 200             205

        Trp Thr Ser Pro Thr Phe Gln Trp Leu Ile Pro Asp Ser Ala Asp Thr
            210                 215                 220

        Thr Ala Thr Pro Thr His Cys Ala Tyr Asp Arg Ile Val Val Ala Gly
        225                 230                 235                 240

        Met Leu Leu Arg Gly Ala Val Val Pro Asp Ser Ala Leu Pro Phe Asn
                        245                 250                 255

        Phe Gln Ala Ala Tyr Gly Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser
                    260                 265                 270

        Asp His Tyr Pro Val Glu Val Met Leu Lys
                275                 280
```

```
<210>   41
<211>   678
<212>   DNA
<213>   Mus musculus

<400>   41
gacatcttgc tgactcagtc tccagccatc ctgtctgtga gtccaggaga aagagtcagt    60

ttctcctgca gggccagtca gttcgttggc tcaagcatcc actggtatca gcaaagaaca   120

aatggttctc caaggcttct cataaagtat gcttctgagt ctatgtctgg gatcccttcc   180

aggtttagtg gcagtggatc agggacagat tttactctta gcatcaacac tgtggagtct   240

gaagatattg cagattatta ctgtcaacaa agtcatagct ggccattcac gttcggctcg   300

gggacaaatt tggaagtaaa agaagtgaag cttgaggagt ctggaggagg cttggtgcaa   360

cctggaggat ccatgaaact ctcctgtgtt gcctctggat tcattttcag taaccactgg   420

atgaactggg tccgccagtc tccagagaag gggcttgagt gggttgctga aattagatca   480

aaatctatta attctgcaac acattatgcg gagtctgtga aagggaggtt caccatctca   540

agagatgatt ccaaaagtgc tgtctacctg caaatgaccg acttaagaac tgaagacact   600

ggcgtttatt actgttccag gaattactac ggtagtacct acgactactg gggccaaggc   660

accactctca cagtctcc                                                 678
```

```
<210>   42
<211>   226
<212>   PRT
<213>   Mus musculus

<400>   42
        Asp Ile Leu Leu Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Pro Gly
        1                 5                 10                  15

        Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Phe Val Gly Ser Ser
                        20                  25                  30
```

```
Ile His Trp Tyr Gln Gln Arg Thr Asn Gly Ser Pro Arg Leu Leu Ile
        35                  40                  45

Lys Tyr Ala Ser Glu Ser Met Ser Gly Ile Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Thr Val Glu Ser
65                  70                  75                  80

Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser His Ser Trp Pro Phe
                85                  90                  95

Thr Phe Gly Ser Gly Thr Asn Leu Glu Val Lys Glu Val Lys Leu Glu
            100                 105                 110

Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Met Lys Leu Ser
        115                 120                 125

Cys Val Ala Ser Gly Phe Ile Phe Ser Asn His Trp Met Asn Trp Val
    130                 135                 140

Arg Gln Ser Pro Glu Lys Gly Leu Glu Trp Val Ala Glu Ile Arg Ser
145                 150                 155                 160

Lys Ser Ile Asn Ser Ala Thr His Tyr Ala Glu Ser Val Lys Gly Arg
                165                 170                 175

Phe Thr Ile Ser Arg Asp Asp Ser Lys Ser Ala Val Tyr Leu Gln Met
            180                 185                 190

Thr Asp Leu Arg Thr Glu Asp Thr Gly Val Tyr Tyr Cys Ser Arg Asn
        195                 200                 205

Tyr Tyr Gly Ser Thr Tyr Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr
    210                 215                 220

Val Ser
225


<210>   43
<211>   450
<212>   DNA
<213>   Homo sapiens

<400>   43
gctgcatcag aagaggccat caagcacatc actgtccttc tgccatggcc ctgtggatgc    60

gcctcctgcc cctgctggcg ctgctggccc tctggggacc tgacccagcc gcagcctttg   120

tgaaccaaca cctgtgcggc tcacacctgg tggaagctct ctacctagtg tgcggggaac   180

gaggcttctt ctacacaccc aagacccgcc gggaggcaga ggacctgcag gtggggcagg   240

tggagctggg cgggggccct ggtgcaggca gcctgcagcc cttggccctg agggggtccc   300

tgcagaagcg tggcattgtg aacaatgct gtaccagcat ctgctccctc taccagctgg   360

agaactactg caactagacg cagcccgcag gcagcccccc acccgccgcc tcctgcaccg   420

agagagatgg aataaagccc ttgaaccagc                                     450
```

```
<210>    44
<211>    110
<212>    PRT
<213>    Homo sapiens

<400>    44
Met Ala Leu Trp Met Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1               5                   10                  15

Trp Gly Pro Asp Pro Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly
            20                  25                  30

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
        35                  40                  45

Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
    50                  55                  60

Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu
65                  70                  75                  80

Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys
                85                  90                  95

Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
                100                 105                 110

<210>    45
<211>    1203
<212>    DNA
<213>    Hepatitis B virus

<400>    45
atgggaggtt ggtcttccaa acctcgacaa ggcatgggga cgaatctttc tgttcccaat    60

cctctgggat tctttcccga tcaccagttg accctgcgt tcggagccaa ctcaaacaat   120

ccagattggg acttcaaccc caacaaggat cactggccag aggcaatcaa ggtaggagcg   180

ggagacttcg gccagggtt caccccacca cacggcggtc ttttgggtg gagccctcag   240

gctcagggca tattgacaac agtgccagca gcgcctcctc ctgtttccac caatcggcag   300

tcaggaagac agcctactcc catctctcca cctctaagag acagtcatcc tcaggccatg   360

cagtggaact ccacaacatt ccaccaagct ctgctagatc cagagtgag gggcctatat   420

tttcctgctg gtggctccag ttccggaaca gtaaaccctg ttccgactac tgtctcaccc   480

atatcgtcaa tcttctcgag gactggggac cctgcaccga acatggagag cacaacatca   540

ggattcctag gacccctgct cgtgttacag gcggggtttt tcttgttgac aagaatcctc   600

acaataccac agagtctaga ctcgtggtgg acttctctca attttctagg gggagcaccc   660

acgtgtcctg gccaaaattc gcagtcccca acctccaatc actcaccaac ctcttgtcct   720

ccaatttgtc ctggttatcg ctggatgtgt ctgcggcgtt ttatcatatt cctcttcatc   780

ctgctgctat gcctcatctt cttgttggtt cttctggact accaaggtat gttgcccgtt   840
```

```
tgtcctctac ttccaggaac atcaactacc agcacgggac catgcaagac ctgcacgatt     900

cctgctcaag gaacctctat gtttccctct tgttgctgta caaaaccttc ggacggaaac     960

tgcacttgta ttcccatccc atcatcctgg ctttcgcaa gattcctatg ggagtgggcc    1020

tcagtccgtt ctcctggct cagtttacta gtgccatttg ttcagtggtt cgcagggctt    1080

tcccccactg tttggctttc agttatatgg atgatgtggt attggggggcc aagtctgtac    1140

aacatcttga gtcccttttt acctctatta ccaattttct tttgtctttg ggtatacatt    1200

tga                                                                   1203
```

<210> 46
<211> 400
<212> PRT
<213> Hepatitis B virus

<400> 46

```
Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu
1               5                   10                  15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
                20                  25                  30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
            35                  40                  45

Lys Asp His Trp Pro Glu Ala Ile Lys Val Gly Ala Gly Asp Phe Gly
        50                  55                  60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Val Ser
                85                  90                  95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
                100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
            115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
        130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Val Ser Pro
145                 150                 155                 160

Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu
                165                 170                 175

Ser Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
                180                 185                 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
            195                 200                 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly
        210                 215                 220
```

```
Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
225             230             235             240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
            245             250             255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260             265             270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser
        275             280             285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly
    290             295             300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305             310             315             320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu
            325             330             335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
            340             345             350

Phe Val Gln Trp Phe Ala Gly Leu Ser Pro Thr Val Trp Leu Ser Val
        355             360             365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser
    370             375             380

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385             390             395             400
```

<210>  47
<211>  799
<212>  DNA
<213>  Homo sapiens

<400>  47

```
cgaaccactc agggtcctgt ggacagctca cctagctgca atggctacag gctcccggac      60

gtccctgctc ctggcttttg gcctgctctg cctgccctgg cttcaagagg gcagtgcctt     120

cccaaccatt cccttatcca ggccttttga caacgctatg ctccgcgccc atcgtctgca     180

ccagctggcc tttgacacct accaggagtt tgaagaagcc tatatcccaa aggaacagaa     240

gtattcattc ctgcagaacc cccagacctc cctctgtttc tcagagtcta ttccgacacc     300

ctccaacagg gaggaaacac aacagaaatc aacctagag ctgctccgca tctccctgct      360

gctcatccag tcgtggctgg agcccgtgca gttcctcagg agtgtcttcg ccaacagcct     420

ggtgtacggc gcctctgaca gcaacgtcta tgacctccta aaggacctag aggaaggcat     480

ccaaacgctg atggggaggc tggaagatgg cagcccccgg actgggcaga tcttcaagca     540

gacctacagc aagttcgaca caaactcaca caacgatgac gcactactca gaactacgg      600

gctgctctac tgcttcagga aggacatgga caaggtcgag acattcctgc gcatcgtgca     660
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gtgccgctct gtggagggca gctgtggctt ctagctgccc gggtggcatc cctgtgaccc     720

ctccccagtg cctctcctgg ccctggaagt tgccactcca gtgcccacca gccttgtcct     780

aataaaatta agttgcatc                                                  799

<210>    48
<211>    217
<212>    PRT
<213>    Homo sapiens

<400>    48
Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1                 5                  10                  15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
            20                  25                  30

Ser Arg Pro Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
        35                  40                  45

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
    50                  55                  60

Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
65                  70                  75                  80

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
            85                  90                  95

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
            100                 105                 110

Leu Glu Pro Val Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val
        115                 120                 125

Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
    130                 135                 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
145                 150                 155                 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
                165                 170                 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
            180                 185                 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
        195                 200                 205

Arg Ser Val Glu Gly Ser Cys Gly Phe
    210                 215

<210>    49
<211>    963
<212>    DNA
<213>    Homo sapiens

<400>    49

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gtcccggccg agtgcttcga cctgctggtc cgccactgcg tggcctgcgg gctcctgcgc    180

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gtcctgcacc aggactggct gaatggcaag gagtacaagt gcaaggtctc caacaaagcc    600

ctcccagccc ccatcgagaa aaccatctcc aaagccaaag gcagccccg agaaccacag      660

gtgtacaccc tgcccccatc ccgggatgag ctgaccaaga accaggtcag cctgacctgc    720

ctggtcaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg    780

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agcaagctca ccgtggacaa gagcaggtgg cagcagggga acgtcttctc atgctccgtg    900

atgcatgagg ctctgcacaa ccactacacg cagaagagcc tctccctgtc tccgggaaaa    960

tga                                                                  963
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<210> 50
<211> 320
<212> PRT
<213> Homo sapiens

<400> 50
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Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1               5                   10                  15

Gly Ser Thr Gly Asp Val Arg Arg Gly Pro Arg Ser Leu Arg Gly Arg
                20                  25                  30

Asp Ala Pro Ala Pro Thr Pro Cys Val Pro Ala Glu Cys Phe Asp Leu
            35                  40                  45

Leu Val Arg His Cys Val Ala Cys Gly Leu Leu Arg Thr Pro Arg Pro
        50                  55                  60

Lys Pro Ala Gly Ala Ser Ser Pro Ala Pro Arg Thr Ala Leu Gln Pro
65                  70                  75                  80

Gln Glu Ser Val Gly Ala Gly Ala Gly Glu Ala Ala Val Asp Lys Thr
                85                  90                  95

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
            100                 105                 110
```

```
Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
        115                 120                 125

Thr Pro Glu Val Thr Cys Val Val Asp Val Ser His Glu Asp Pro
    130                 135                 140

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
145                 150                 155                 160

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
                165                 170                 175

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
            180                 185                 190

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
        195                 200                 205

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
    210                 215                 220

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
225                 230                 235                 240

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
            245                 250                 255

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
            260                 265                 270

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
        275                 280                 285

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
    290                 295                 300

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
305                 310                 315                 320
```

```
<210>  51
<211>  107
<212>  PRT
<213>  Homo sapiens

<400>  51
Asp Ile Gln Met Thr Gln Thr Pro Ser Thr Leu Ser Ala Ser Val Gly
1               5                   10                  15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
            20                  25                  30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro
65                  70                  75                  80

Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
```

```
                    85                     90                     95
Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys
            100                 105


<210>   52
<211>   107
<212>   PRT
<213>   Mus musculus

<400>   52
Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1               5                   10                  15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
            20                  25                  30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Ile Val Lys Leu Leu Ile
        35                  40                  45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65                  70                  75                  80

Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
                85                  90                  95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105


<210>   53
<211>   119
<212>   PRT
<213>   Homo sapiens

<400>   53
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1               5                   10                  15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe Thr Asn Tyr
            20                  25                  30

Leu Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
    50                  55                  60

Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr
65                  70                  75                  80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys
                85                  90                  95

Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly
            100                 105                 110

Thr Leu Val Thr Val Ser Ser
        115
```

```
<210>   54
<211>   119
<212>   PRT
<213>   Mus musculus

<400>   54
Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Val Gly Pro Gly Thr
1               5                   10                  15


Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe Thr Asn Tyr
            20                  25                  30


Leu Ile Glu Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45


Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
    50                  55                  60


Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr Ala Tyr
65                  70                  75                  80


Met Gln Leu Ser Ser Leu Thr Ser Asp Asp Ser Ala Val Tyr Phe Cys
                85                  90                  95


Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Arg Gly
            100                 105                 110


Thr Leu Val Thr Val Ser Ala
        115


<210>   55
<211>   214
<212>   PRT
<213>   Homo sapiens

<400>   55
Asp Ile Gln Met Thr Gln Thr Pro Ser Thr Leu Ser Ala Ser Val Gly
1               5                   10                  15


Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
            20                  25                  30


Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45


Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60


Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro
65                  70                  75                  80


Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
                85                  90                  95


Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys Arg Thr Val Ala Ala
            100                 105                 110


Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
        115                 120                 125
```

```
Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
    130                 135                 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145                 150                 155                 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
                165                 170                 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
            180                 185                 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
        195                 200                 205

Phe Asn Arg Gly Glu Cys
    210
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```
<210>   56
<211>   448
<212>   PRT
<213>   Homo sapiens
```

```
<400>   56
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1               5                   10                  15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe Thr Asn Tyr
            20                  25                  30

Leu Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
    50                  55                  60

Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr
65                  70                  75                  80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys
                85                  90                  95

Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly
            100                 105                 110

Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
        115                 120                 125

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
    130                 135                 140

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
145                 150                 155                 160

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
                165                 170                 175

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
            180                 185                 190

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
```

```
                195                      200                     205
```

Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys
    210                  215               220

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro
225                  230               235                   240

Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
             245               250                   255

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
            260               265                   270

Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
         275               280                   285

Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
    290                  295               300

Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
305                  310               315                   320

Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys
             325               330                   335

Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
             340               345                   350

Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr
             355               360                   365

Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
    370               375               380

Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
385                  390               395                   400

Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
             405               410                   415

Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu
             420               425               430

Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
         435               440               445

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<210>  57
<211>  8540
<212>  DNA
<213>  Homo sapiens

<400>  57
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aggccgaggc ggcctcggcc tctgcataaa taaaaaaaat tagtcagcca tgcatggggc    120

ggagaatggg cggaactggg cggagttagg ggcgggatgg gcggagttag gggcgggact    180

atggttgctg actaattgag atgcatgctt tgcatacttc tgcctgctgg ggagcctggg    240
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gactttccac acctggttgc tgactaattg agatgcatgc tttgcatact tctgcctgct    300

ggggagcctg gggactttcc acaccctaac tgacacacat tccacagaat taattcccct    360

agttattaat agtaatcaat tacggggtca ttagttcata gcccatatat ggagttccgc    420

gttacataac ttacggtaaa tggcccgcct ggctgaccgc ccaacgaccc ccgcccattg    480

acgtcaataa tgacgtatgt tcccatagta acgccaatag ggactttcca ttgacgtcaa    540

tgggtggact atttacggta aactgcccac ttggcagtac atcaagtgta tcatatgcca    600

agtacgcccc ctattgacgt caatgacggt aaatggcccg cctggcatta tgcccagtac    660

atgaccttat gggactttcc tacttggcag tacatctacg tattagtcat cgctattacc    720

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tttccaagtc tccaccccat tgacgtcaat gggagtttgt tttggcacca aaatcaacgg    840

gactttccaa aatgtcgtaa caactccgcc ccattgacgc aaatgggcgg taggcgtgta    900

cggtgggagg tctatataag cagagctggg tacgtgaacc gtcagatcgc ctggagacgc    960

catcacagat ctctcaccat gagggtcccc gctcagctcc tggggctcct gctgctctgg   1020

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ggcatctgg ggatgcggtg ggctctatgg aaccagctgg ggctcgacag cgctggatct    3480

cccgatcccc agctttgctt ctcaatttct tatttgcata atgagaaaaa aaggaaaatt    3540

aattttaaca ccaattcagt agttgattga gcaaatgcgt tgccaaaaag gatgctttag    3600

agacagtgtt ctctgcacag ataaggacaa acattattca gaggagtac ccagagctga    3660

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gacctaccct ggcctccgct caggaacgag ttcaagtact tccaaagaat gaccacaacc   4080

tcttcagtgg aaggtaaaca gaatctggtg attatgggta ggaaaacctg gttctccatt   4140

cctgagaaca atcgaccttt aaaggacaga attaatatag ttctcagtag agaactcaaa   4200

gaaccaccac gaggagctca ttttcttgcc aaaagtttgg atgatgcctt aagacttatt   4260

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accaattcag tagttgattg agcaaatgcg ttgccaaaaa ggatgcttta gagacagtgt   4980

tctctgcaca gataaggaca aacattattc agagggagta cccagagctg agactcctaa   5040

gccagtgagt ggcacagcat tctagggaga aatatgcttg tcatcaccga agcctgattc   5100

cgtagagcca caccttggta agggccaatc tgctcacaca ggatagagag gcaggagcc   5160

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tgcaaggctt ctggctacac atttaccagt tacaatatgc actgggtaaa acagacacct     180

ggtcggggcc tggaatggat tggagctatt tatcccggaa atggtgatac ttcctacaat     240

cagaagttca aaggcaaggc cacattgact gcagacaaat cctccagcac agcctacatg     300

cagctcagca gcctgacatc tgaggactct gcggtctatt actgtgcaag atcgacttac     360

tacggcggtg actggtactt caatgtctgg ggcgcaggga ccacggtcac cgtctctgca     420

<210>    62
<211>    140
<212>    PRT
<213>    Mus musculus

<400>    62
Met Gly Trp Ser Leu Ile Leu Leu Phe Leu Val Ala Val Ala Thr Arg
1               5                   10                  15

Val Leu Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
            20                  25                  30

Pro Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe
            35                  40                  45

Thr Ser Tyr Asn Met His Trp Val Lys Gln Thr Pro Gly Arg Gly Leu
        50                  55                  60

Glu Trp Ile Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn
65                  70                  75                  80

Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
                85                  90                  95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
            100                 105                 110

Tyr Tyr Cys Ala Arg Ser Thr Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn
        115                 120                 125

Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ala
    130                 135                 140

<210>    63
<211>    1395
<212>    DNA
<213>    Homo sapiens

<400>    63
atgtattcca atgtgatagg aactgtaacc tctggaaaaa ggaaggttta tcttttgtcc     60

ttgctgctca ttggcttctg ggactgcgtg acctgtcacg ggagccctgt ggacatctgc    120

acagccaagc cgcgggacat tcccatgaat cccatgtgca tttaccgctc cccggagaag    180

aaggcaactg aggatgaggg ctcagaacag aagatcccgg aggccaccaa ccggcgtgtc    240

tgggaactgt ccaaggccaa ttcccgcttt gctaccactt tctatcagca cctggcagat    300

tccaagaatg acaatgataa cattttcctg tcacccctga gtatctccac ggcttttgct    360

atgaccaagc tgggtgcctg taatgacacc ctccagcaac tgatggaggt atttaagttt    420

gacaccatat ctgagaaaac atctgatcag atccacttct tctttgccaa actgaactgc    480

cgactctatc gaaaagccaa caaatcctcc aagttagtat cagccaatcg ccttttttgga    540

gacaaatccc ttaccttcaa tgagacctac caggacatca gtgagttggt atatggagcc    600

aagctccagc ccctggactt caaggaaaat gcagagcaat ccagagcggc catcaacaaa    660

tgggtgtcca ataagaccga aggccgaatc accgatgtca ttccctcgga agccatcaat    720

gagctcactg ttctggtgct ggttaacacc atttacttca agggcctgtg gaagtcaaag    780

ttcagccctg agaacacaag gaaggaactg ttctacaagg ctgatggaga gtcgtgttca    840

gcatctatga tgtaccagga aggcaagttc cgttatcggc gcgtggctga aggcacccag    900

gtgcttgagt tgcccttcaa aggtgatgac atcaccatgg tcctcatctt gcccaagcct    960

gagaagagcc tggccaaggt ggagaaggaa ctcaccccag aggtgctgca ggagtggctg    1020

gatgaattgg aggagatgat gctggtggtc cacatgcccc gcttccgcat tgaggacggc    1080

ttcagtttga aggagcagct gcaagacatg ggccttgtcg atctgttcag ccctgaaaag    1140

tccaaactcc caggtattgt tgcagaaggc cgagatgacc tctatgtctc agatgcattc    1200

cataaggcat ttcttgaggt aaatgaagaa ggcagtgaag cagctgcaag taccgctgtt    1260

gtgattgctg ccgttcgct aaaccccaac agggtgactt caaggccaa caggcctttc      1320

ctggttttta taagagaagt tcctctgaac actattatct tcatgggcag agtagccaac    1380

ccttgtgtta agtaa                                                      1395

<210> 64
<211> 464
<212> PRT
<213> Homo sapiens

<400> 64
Met Tyr Ser Asn Val Ile Gly Thr Val Thr Ser Gly Lys Arg Lys Val
1               5                   10                  15

Tyr Leu Leu Ser Leu Leu Leu Ile Gly Phe Trp Asp Cys Val Thr Cys
            20                  25                  30

His Gly Ser Pro Val Asp Ile Cys Thr Ala Lys Pro Arg Asp Ile Pro
        35                  40                  45

Met Asn Pro Met Cys Ile Tyr Arg Ser Pro Glu Lys Lys Ala Thr Glu
    50                  55                  60

Asp Glu Gly Ser Glu Gln Lys Ile Pro Glu Ala Thr Asn Arg Arg Val
65                  70                  75                  80

Trp Glu Leu Ser Lys Ala Asn Ser Arg Phe Ala Thr Thr Phe Tyr Gln
                85                  90                  95

His Leu Ala Asp Ser Lys Asn Asp Asn Asp Asn Ile Phe Leu Ser Pro
            100                 105                 110

Leu Ser Ile Ser Thr Ala Phe Ala Met Thr Lys Leu Gly Ala Cys Asn
            115                 120                 125

Asp Thr Leu Gln Gln Leu Met Glu Val Phe Lys Phe Asp Thr Ile Ser
    130                 135                 140

Glu Lys Thr Ser Asp Gln Ile His Phe Phe Phe Ala Lys Leu Asn Cys
145                 150                 155                 160

Arg Leu Tyr Arg Lys Ala Asn Lys Ser Ser Lys Leu Val Ser Ala Asn
                165                 170                 175

Arg Leu Phe Gly Asp Lys Ser Leu Thr Phe Asn Glu Thr Tyr Gln Asp
            180                 185                 190

Ile Ser Glu Leu Val Tyr Gly Ala Lys Leu Gln Pro Leu Asp Phe Lys

```
        195               200              205
```

Glu Asn Ala Glu Gln Ser Arg Ala Ala Ile Asn Lys Trp Val Ser Asn
    210               215              220

Lys Thr Glu Gly Arg Ile Thr Asp Val Ile Pro Ser Glu Ala Ile Asn
225               230              235              240

Glu Leu Thr Val Leu Val Leu Val Asn Thr Ile Tyr Phe Lys Gly Leu
              245              250              255

Trp Lys Ser Lys Phe Ser Pro Glu Asn Thr Arg Lys Glu Leu Phe Tyr
              260              265              270

Lys Ala Asp Gly Glu Ser Cys Ser Ala Ser Met Met Tyr Gln Glu Gly
              275              280              285

Lys Phe Arg Tyr Arg Arg Val Ala Glu Gly Thr Gln Val Leu Glu Leu
              290              295              300

Pro Phe Lys Gly Asp Asp Ile Thr Met Val Leu Ile Leu Pro Lys Pro
305               310              315              320

Glu Lys Ser Leu Ala Lys Val Glu Lys Glu Leu Thr Pro Glu Val Leu
              325              330              335

Gln Glu Trp Leu Asp Glu Leu Glu Glu Met Met Leu Val Val His Met
              340              345              350

Pro Arg Phe Arg Ile Glu Asp Gly Phe Ser Leu Lys Glu Gln Leu Gln
              355              360              365

Asp Met Gly Leu Val Asp Leu Phe Ser Pro Glu Lys Ser Lys Leu Pro
    370               375              380

Gly Ile Val Ala Glu Gly Arg Asp Asp Leu Tyr Val Ser Asp Ala Phe
385               390              395              400

His Lys Ala Phe Leu Glu Val Asn Glu Glu Gly Ser Glu Ala Ala Ala
              405              410              415

Ser Thr Ala Val Val Ile Ala Gly Arg Ser Leu Asn Pro Asn Arg Val
              420              425              430

Thr Phe Lys Ala Asn Arg Pro Phe Leu Val Phe Ile Arg Glu Val Pro
              435              440              445

Leu Asn Thr Ile Ile Phe Met Gly Arg Val Ala Asn Pro Cys Val Lys
    450               455              460

```
<210>  65
<211>  1962
<212>  DNA
<213>  Homo sapiens

<400>  65
atgcgtcccc tgcgcccccg cgccgcgctg ctggcgctcc tggcctcgct cctggccgcg     6

cccccggtgg ccccggccga ggccccgcac ctggtgcagg tggacgcggc ccgcgcgctg    12

tggcccctgc ggcgcttctg gaggagcaca ggcttctgcc ccccgctgcc acacagccag    18
```

```
gctgaccagt acgtcctcag ctgggaccag cagctcaacc tcgcctatgt gggcgccgtc    240

cctcaccgcg gcatcaagca ggtccggacc cactggctgc tggagcttgt caccaccagg    300

gggtccactg gacggggcct gagctacaac ttcacccacc tggacgggta cttggacctt    360

ctcagggaga accagctcct cccagggttt gagctgatgg gcagcgcctc gggccacttc    420

actgactttg aggacaagca gcaggtgttt gagtggaagg acttggtctc cagcctggcc    480

aggagataca tcggtaggta cggactggcg catgtttcca gtggaacttt cgagacgtgg    540

aatgagccag accaccacga ctttgacaac gtctccatga ccatgcaagg cttcctgaac    600

tactacgatg cctgctcgga gggtctgcgc gccgccagcc ccgccctgcg gctgggaggc    660

cccggcgact ccttccacac cccaccgcga tccccgctga gctggggcct cctgcgccac    720

tgccacgacg gtaccaactt cttcactggg gaggcgggcg tgcggctgga ctacatctcc    780

ctccacagga agggtgcgcg cagctccatc tccatcctgg agcaggagaa ggtcgtcgcg    840

cagcagatcc ggcagctctt ccccaagttc gcggacaccc ccatttacaa cgacgaggcg    900

gacccgctgg tgggctggtc cctgccacag ccgtggaggg cggacgtgac ctacgcggcc    960

atggtggtga aggtcatcgc gcagcatcag aacctgctac tggccaacac cacctccgcc   1020

ttcccctacg cgctcctgag caacgacaat gccttcctga ctaccaccc gcaccccttc   1080

gcgcagcgca cgctcaccgc gcgcttccag gtcaacaaca cccgcccgcc gcacgtgcag   1140

ctgttgcgca agccggtgct cacggccatg gggctgctgg cgctgctgga tgaggagcag   1200

ctctgggccg aagtgtcgca ggccgggacc gtcctggaca gcaaccacac ggtgggcgtc   1260

ctggccagcg cccaccgccc ccagggcccg gccgacgcct ggcgcgccgc ggtgctgatc   1320

tacgcgagcg acgacacccg cgcccacccc aaccgcagcg tcgcggtgac cctgcggctg   1380

cgcggggtgc cccccggccc gggcctggtc tacgtcacgc gctacctgga caacgggctc   1440

tgcagccccg acggcgagtg gcggcgcctg gccggcccg tcttccccac ggcagagcag   1500

ttccggcgca tgcgcgcggc tgaggacccg gtggccgcgg cgcccccgccc cttacccgcc   1560

ggcggccgcc tgaccctgcg ccccgcgctg cggctgccgt cgcttttgct ggtgcacgtg   1620

tgtgcgcgcc ccgagaagcc gcccgggcag gtcacgcggc tccgcgccct gcccctgacc   1680

caagggcagc tggttctggt ctggtcggat gaacacgtgg ctccaagtg cctgtggaca   1740

tacgagatcc agttctctca ggacggtaag gcgtacaccc cggtcagcag gaagccatcg   1800

accttcaacc tctttgtgtt cagcccagac acaggtgctg tctctggctc ctaccgagtt   1860

cgagccctgg actactgggc ccgaccaggc cccttctcgg accctgtgcc gtacctggag   1920

gtccctgtgc caagagggcc cccatccccg ggcaatccat ga                     1962
```

71

```
<210>  66
<211>  653
<212>  PRT
<213>  Homo sapiens

<400>  66
Met Arg Pro Leu Arg Pro Arg Ala Ala Leu Leu Ala Leu Leu Ala Ser
1               5                   10                  15

Leu Leu Ala Ala Pro Pro Val Ala Pro Ala Glu Ala Pro His Leu Val
            20                  25                  30

Gln Val Asp Ala Ala Arg Ala Leu Trp Pro Leu Arg Arg Phe Trp Arg
        35                  40                  45

Ser Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr
    50                  55                  60

Val Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val
65                  70                  75                  80

Pro His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu
                85                  90                  95

Val Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr
            100                 105                 110

His Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Leu Pro
        115                 120                 125

Gly Phe Glu Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu
    130                 135                 140

Asp Lys Gln Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala
145                 150                 155                 160

Arg Arg Tyr Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn
                165                 170                 175

Phe Glu Thr Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser
            180                 185                 190

Met Thr Met Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly
        195                 200                 205

Leu Arg Ala Ala Ser Pro Ala Leu Arg Leu Gly Gly Pro Gly Asp Ser
    210                 215                 220

Phe His Thr Pro Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His
225                 230                 235                 240

Cys His Asp Gly Thr Asn Phe Phe Thr Gly Glu Ala Gly Val Arg Leu
                245                 250                 255

Asp Tyr Ile Ser Leu His Arg Lys Gly Ala Arg Ser Ser Ile Ser Ile
            260                 265                 270

Leu Glu Gln Glu Lys Val Val Ala Gln Gln Ile Arg Gln Leu Phe Pro
        275                 280                 285

Lys Phe Ala Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val
```

290                          295                          300

Gly Trp Ser Leu Pro Gln Pro Trp Arg Ala Asp Val Thr Tyr Ala Ala
305                  310                  315                  320

Met Val Val Lys Val Ile Ala Gln His Gln Asn Leu Leu Leu Ala Asn
                325                  330                  335

Thr Thr Ser Ala Phe Pro Tyr Ala Leu Leu Ser Asn Asp Asn Ala Phe
            340                  345                  350

Leu Ser Tyr His Pro His Pro Phe Ala Gln Arg Thr Leu Thr Ala Arg
        355                  360                  365

Phe Gln Val Asn Asn Thr Arg Pro Pro His Val Gln Leu Leu Arg Lys
    370                  375                  380

Pro Val Leu Thr Ala Met Gly Leu Leu Ala Leu Leu Asp Glu Glu Gln
385                  390                  395                  400

Leu Trp Ala Glu Val Ser Gln Ala Gly Thr Val Leu Asp Ser Asn His
                405                  410                  415

Thr Val Gly Val Leu Ala Ser Ala His Arg Pro Gln Gly Pro Ala Asp
            420                  425                  430

Ala Trp Arg Ala Ala Val Leu Ile Tyr Ala Ser Asp Asp Thr Arg Ala
        435                  440                  445

His Pro Asn Arg Ser Val Ala Val Thr Leu Arg Leu Arg Gly Val Pro
    450                  455                  460

Pro Gly Pro Gly Leu Val Tyr Val Thr Arg Tyr Leu Asp Asn Gly Leu
465                  470                  475                  480

Cys Ser Pro Asp Gly Glu Trp Arg Arg Leu Gly Arg Pro Val Phe Pro
            485                  490                  495

Thr Ala Glu Gln Phe Arg Arg Met Arg Ala Ala Glu Asp Pro Val Ala
            500                  505                  510

Ala Ala Pro Arg Pro Leu Pro Ala Gly Gly Arg Leu Thr Leu Arg Pro
        515                  520                  525

Ala Leu Arg Leu Pro Ser Leu Leu Leu Val His Val Cys Ala Arg Pro
    530                  535                  540

Glu Lys Pro Pro Gly Gln Val Thr Arg Leu Arg Ala Leu Pro Leu Thr
545                  550                  555                  560

Gln Gly Gln Leu Val Leu Val Trp Ser Asp Glu His Val Gly Ser Lys
            565                  570                  575

Cys Leu Trp Thr Tyr Glu Ile Gln Phe Ser Gln Asp Gly Lys Ala Tyr
            580                  585                  590

Thr Pro Val Ser Arg Lys Pro Ser Thr Phe Asn Leu Phe Val Phe Ser
        595                  600                  605

Pro Asp Thr Gly Ala Val Ser Gly Ser Tyr Arg Val Arg Ala Leu Asp
    610                  615                  620

```
Tyr Trp Ala Arg Pro Gly Pro Phe Ser Asp Pro Val Pro Tyr Leu Glu
625             630             635             640

Val Pro Val Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro
            645             650
```

```
<210>   67
<211>   1290
<212>   DNA
<213>   Homo sapiens
```

```
<400>   67
atgcagctga ggaacccaga actacatctg ggctgcgcgc ttgcgcttcg cttcctggcc      60

ctcgtttcct gggacatccc tggggctaga gcactggaca atggattggc aaggacgcct     120

accatgggct ggctgcactg ggagcgcttc atgtgcaacc ttgactgcca ggaagagcca     180

gattcctgca tcagtgagaa gctcttcatg gagatggcag agctcatggt ctcagaaggc     240

tggaaggatg caggttatga gtacctctgc attgatgact gttggatggc tccccaaaga     300

gattcagaag gcagacttca ggcagaccct cagcgctttc ctcatgggat tcgccagcta     360

gctaattatg ttcacagcaa aggactgaag ctagggattt atgcagatgt tggaaataaa     420

acctgcgcag gcttccctgg gagtttggga tactacgaca ttgatgccca gacctttgct     480

gactggggag tagatctgct aaaatttgat ggttgttact gtgacagttt ggaaaatttg     540

gcagatggtt ataagcacat gtccttggcc ctgaatagga ctggcagaag cattgtgtac     600

tcctgtgagt ggcctctttta tatgtggccc tttcaaaagc ccaattatac agaaatccga     660

cagtactgca atcactggcg aaatttttgct gacattgatg attcctggaa aagtataaag     720

agtatcttgg actggacatc ttttaaccag gagagaattg ttgatgttgc tggaccaggg     780

ggttggaatg acccagatat gttagtgatt ggcaactttg gcctcagctg gaatcagcaa     840

gtaactcaga tggccctctg ggctatcatg gctgctcctt tattcatgtc taatgacctc     900

cgacacatca gccctcaagc caaagctctc cttcaggata aggacgtaat tgccatcaat     960

caggacccct tgggcaagca agggtaccag cttagacagg gagacaactt tgaagtgtgg    1020

gaacgacctc tctcaggctt agcctgggct gtagctatga taaaccggca ggagattggt    1080

ggacctcgct cttataccat cgcagttgct ccctgggta aaggagtggc ctgtaatcct    1140

gcctgcttca tcacacagct cctccctgtg aaaaggaagc tagggttcta tgaatggact    1200

tcaaggttaa gaagtcacat aaatcccaca ggcactgttt tgcttcagct agaaaataca    1260

atgcagatgt cattaaaaga cttactttaa                                      1290
```

```
<210>   68
<211>   429
<212>   PRT
<213>   Homo sapiens
```

74

&lt;400&gt;  68

Met Gln Leu Arg Asn Pro Glu Leu His Leu Gly Cys Ala Leu Ala Leu
1               5                  10                 15

Arg Phe Leu Ala Leu Val Ser Trp Asp Ile Pro Gly Ala Arg Ala Leu
            20                  25                 30

Asp Asn Gly Leu Ala Arg Thr Pro Thr Met Gly Trp Leu His Trp Glu
        35                  40                 45

Arg Phe Met Cys Asn Leu Asp Cys Gln Glu Glu Pro Asp Ser Cys Ile
    50                  55                 60

Ser Glu Lys Leu Phe Met Glu Met Ala Glu Leu Met Val Ser Glu Gly
65                  70                 75                 80

Trp Lys Asp Ala Gly Tyr Glu Tyr Leu Cys Ile Asp Asp Cys Trp Met
                85                  90                 95

Ala Pro Gln Arg Asp Ser Glu Gly Arg Leu Gln Ala Asp Pro Gln Arg
            100                 105                110

Phe Pro His Gly Ile Arg Gln Leu Ala Asn Tyr Val His Ser Lys Gly
        115                 120                125

Leu Lys Leu Gly Ile Tyr Ala Asp Val Gly Asn Lys Thr Cys Ala Gly
    130                 135                140

Phe Pro Gly Ser Phe Gly Tyr Tyr Asp Ile Asp Ala Gln Thr Phe Ala
145                 150                155                160

Asp Trp Gly Val Asp Leu Leu Lys Phe Asp Gly Cys Tyr Cys Asp Ser
            165                 170                175

Leu Glu Asn Leu Ala Asp Gly Tyr Lys His Met Ser Leu Ala Leu Asn
            180                 185                190

Arg Thr Gly Arg Ser Ile Val Tyr Ser Cys Glu Trp Pro Leu Tyr Met
        195                 200                205

Trp Pro Phe Gln Lys Pro Asn Tyr Thr Glu Ile Arg Gln Tyr Cys Asn
    210                 215                220

His Trp Arg Asn Phe Ala Asp Ile Asp Asp Ser Trp Lys Ser Ile Lys
225                 230                235                240

Ser Ile Leu Asp Trp Thr Ser Phe Asn Gln Glu Arg Ile Val Asp Val
            245                 250                255

Ala Gly Pro Gly Gly Trp Asn Asp Pro Asp Met Leu Val Ile Gly Asn
            260                 265                270

Phe Gly Leu Ser Trp Asn Gln Gln Val Thr Gln Met Ala Leu Trp Ala
        275                 280                285

Ile Met Ala Ala Pro Leu Phe Met Ser Asn Asp Leu Arg His Ile Ser
    290                 295                300

Pro Gln Ala Lys Ala Leu Leu Gln Asp Lys Asp Val Ile Ala Ile Asn
305                 310                315                320

```
Gln Asp Pro Leu Gly Lys Gln Gly Tyr Gln Leu Arg Gln Gly Asp Asn
            325                 330             335

Phe Glu Val Trp Glu Arg Pro Leu Ser Gly Leu Ala Trp Ala Val Ala
            340                 345             350

Met Ile Asn Arg Gln Glu Ile Gly Gly Pro Arg Ser Tyr Thr Ile Ala
            355                 360             365

Val Ala Ser Leu Gly Lys Gly Val Ala Cys Asn Pro Ala Cys Phe Ile
        370                 375             380

Thr Gln Leu Leu Pro Val Lys Arg Lys Leu Gly Phe Tyr Glu Trp Thr
385                 390             395                 400

Ser Arg Leu Arg Ser His Ile Asn Pro Thr Gly Thr Val Leu Leu Gln
            405                 410             415

Leu Glu Asn Thr Met Gln Met Ser Leu Lys Asp Leu Leu
            420             425
```

```
<210>  69
<211>  351
<212>  DNA
<213>  Homo sapiens

<400>  69
atggattact acagaaaata tgcagctatc tttctggtca cattgtcggt gtttctgcat     60

gttctccatt ccgctcctga tgtgcaggat tgcccagaat gcacgctaca ggaaaaccca    120

ttcttctccc agccgggtgc cccaatactt cagtgcatgg gctgctgctt ctctagagca    180

tatcccactc cactaaggtc caagaagacg atgttggtcc aaaagaacgt cacctcagag    240

tccacttgct gtgtagctaa atcatataac agggtcacag taatggggg tttcaaagtg    300

gagaaccaca cggcgtgcca ctgcagtact tgttattatc acaaatctta a             351
```

```
<210>  70
<211>  116
<212>  PRT
<213>  Homo sapiens

<400>  70
Met Asp Tyr Tyr Arg Lys Tyr Ala Ala Ile Phe Leu Val Thr Leu Ser
1               5                 10              15

Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro
            20                  25              30

Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro
        35                  40              45

Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro
    50                  55              60

Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu
65                  70              75                  80
```

```
Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly
             85                  90                  95
```

```
Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr
             100                 105                 110
```

```
Tyr His Lys Ser
         115
```

```
<210>   71
<211>   498
<212>   DNA
<213>   Homo sapiens
```

```
<400>   71
atggagatgt tccaggggct gctgctgttg ctgctgctga gcatgggcgg gacatgggca    60

tccaaggagc cgcttcggcc acggtgccgc cccatcaatg ccaccctggc tgtggagaag    120

gagggctgcc ccgtgtgcat caccgtcaac accaccatct gtgccggcta ctgccccacc    180

atgacccgcg tgctgcaggg ggtcctgccg gccctgcctc aggtggtgtg caactaccgc    240

gatgtgcgct tcgagtccat ccggctccct ggctgcccgc gcggcgtgaa ccccgtggtc    300

tcctacgccg tggctctcag ctgtcaatgt gcactctgcc gccgcagcac cactgactgc    360

gggggtccca aggaccaccc cttgacctgt gatgaccccc gcttccagga ctcctcttcc    420

tcaaaggccc ctccccccag ccttccaagc ccatcccgac tcccgggggcc ctcggacacc    480

ccgatcctcc acaataa                                                   498
```

```
<210>   72
<211>   165
<212>   PRT
<213>   Homo sapiens
```

```
<400>   72
Met Glu Met Phe Gln Gly Leu Leu Leu Leu Leu Leu Ser Met Gly
1               5                   10                  15
```

```
Gly Thr Trp Ala Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile
             20                  25                  30
```

```
Asn Ala Thr Leu Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr
             35                  40                  45
```

```
Val Asn Thr Thr Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val
         50                  55                  60
```

```
Leu Gln Gly Val Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg
65                  70                  75                  80
```

```
Asp Val Arg Phe Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val
             85                  90                  95
```

```
Asn Pro Val Val Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu
             100                 105                 110
```

```
Cys Arg Arg Ser Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu
```

                115                           120                         125

Thr Cys Asp Asp Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro
    130                   135               140

Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
145               150                   155                   160

Pro Ile Leu Pro Gln
                165

<210>   73
<211>   165
<212>   PRT
<213>   Homo sapiens

<400>   73
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1               5                   10                  15

Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30

Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45

Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60

Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80

Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95

Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110

Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125

Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140

Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
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Cys Arg Thr Gly Asp
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Leu Ser Arg Asn Thr Leu Val Leu Leu His Gln Met Arg Arg Ile Ser
        35                  40                  45

Pro Phe Leu Cys Leu Lys Asp Arg Arg Asp Phe Arg Phe Pro Gln Glu
    50                  55                  60

Met Val Lys Gly Ser Gln Leu Gln Lys Ala His Val Met Ser Val Leu
65                  70                  75                  80

His Glu Met Leu Gln Gln Ile Phe Ser Leu Phe His Thr Glu Arg Ser
                85                  90                  95

Ser Ala Ala Trp Asn Met Thr Leu Leu Asp Gln Leu His Thr Gly Leu
            100                 105                 110

His Gln Gln Leu Gln His Leu Glu Thr Cys Leu Leu Gln Val Val Gly
        115                 120                 125

Glu Gly Glu Ser Ala Gly Ala Ile Ser Ser Pro Ala Leu Thr Leu Arg
    130                 135                 140

Arg Tyr Phe Gln Gly Ile Arg Val Tyr Leu Lys Glu Lys Lys Tyr Ser
145                 150                 155                 160

Asp Cys Ala Trp Glu Val Val Arg Met Glu Ile Met Lys Ser Leu Phe
                165                 170                 175

Leu Ser Thr Asn Met Gln Glu Arg Leu Arg Ser Lys Asp Arg Asp Leu
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Gly Ser Ser
        195
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79